FURUNO

Installation Manual
UAIS TRANSPONDER
FA-150

FURUNO ELECTRIC CO., LTD.

www.furuno.co.jp

(Elemental Chlorine Free)

The paper used in this manual
is elemental chlorine free.

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⚠ SAFETY INSTRUCTIONS

The installer must read the safety instructions before attempting to install this equipment.

⚠ WARNING	Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.
⚠ CAUTION	Indicates a potentially hazardous situation which, if not avoided, can result in minor or moderate injury.

Warning, Caution — Prohibitive Action — Mandatory Action

⚠ WARNING

ELECTRICAL SHOCK HAZARD
Do not open the equipment unless totally familiar with electrical circuits and service manual.

Only qualified personnel should work inside the equipment.

Turn off the power at the switch-board before beginning the installation.

Fire or electrical shock can result if the power is left on.

Do not install the equipment where it may get wet from rain or water splash.

Water in the equipment can result in fire, electrical shock or damage the equipment.

Be sure that the power supply is compatible with the voltage rating of the equipment.

Connection of an incorrect power supply can cause fire or damage the equipment. The voltage rating of the equipment appears on the label above the power connector.

⚠ CAUTION

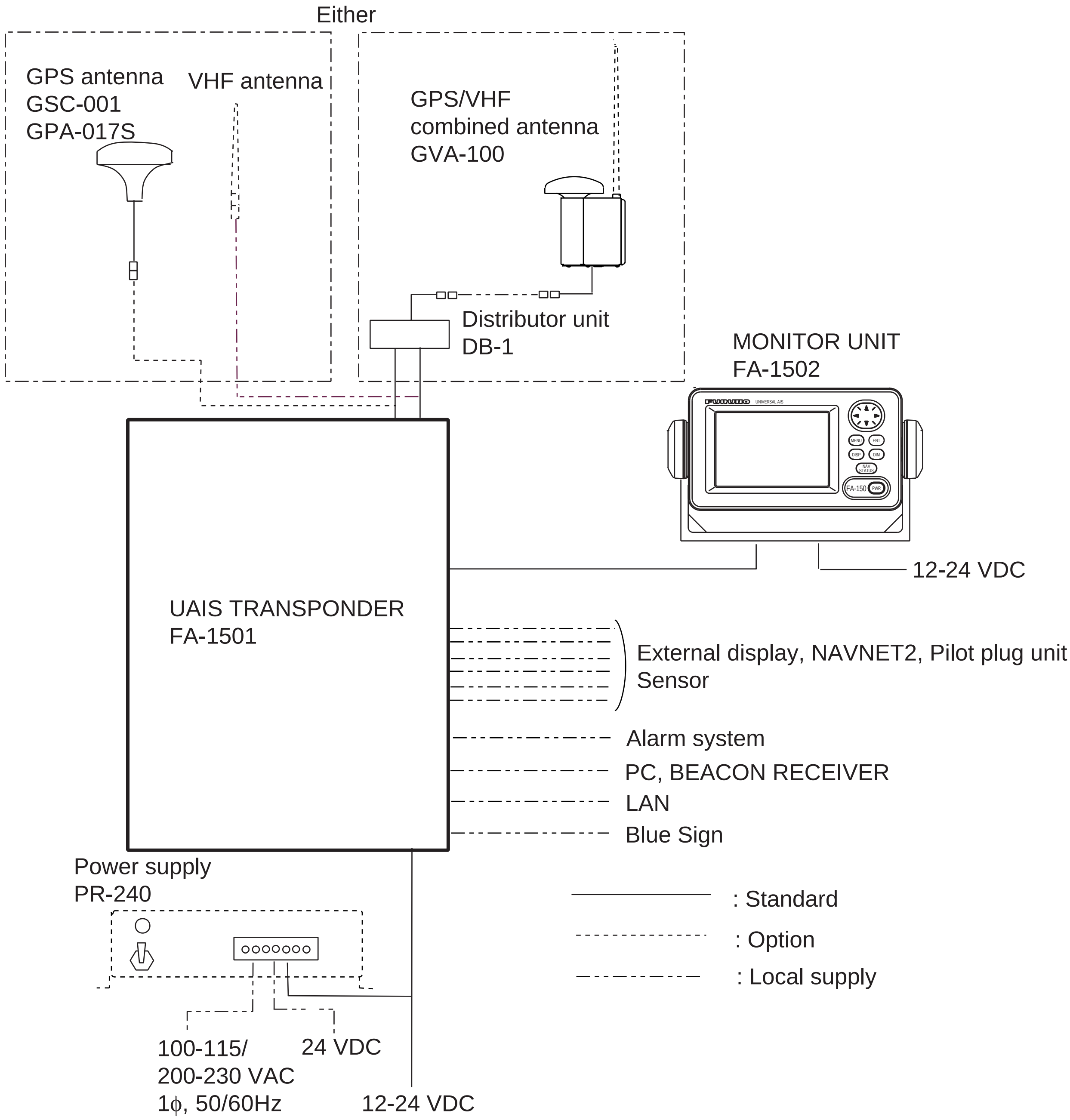
Observe the following compass safe distances to prevent interference to a magnetic compass:

	Standard compass	Steering compass
FA-1501 UAIS Transponder	1.2 m	0.8 m
FA-1502 Monitor unit	0.45 m	0.3 m
GVA-100	0.3 m	0.3 m
DB-1	0.3 m	0.3 m
PR-240	0.9m	0.6 m

Attach securely protective earth to the ship's body.

The protective earth is required to the power supply to prevent electrical shock.

SYSTEM CONFIGURATION



Category of the units

GSC-001	Exposed to the weather
GPA-017S	Exposed to the weather
GVA-100	Exposed to the weather
FA-1501	Protected from the weather
FA-1502	Protected from the weather
DB-1	Protected from the weather
PR-240	Protected from the weather

EQUIPMENT LISTS

Standard supply

No.	Name	Type	Code no.	Qty	Remarks
1	UAIS Transponder	FA-1501	-	1	
2	Monitor Unit	FA-1502	-	1	
3	GPS Antenna	GSC-001	-	1	Select one.
		GPA-017S	-		
	GPS/VHF Combined	GVA-100	-		
4	Installation Materials	MJ-A10SPF0012-050	000-150-216	1	Cable for FA-1501
		CP24-00501	005-955-550		For FA-1501
		CP24-00400	000-041-980	1	For FA-1502 CP14-06001 & Cable MJ-A3SPF0013-0 35
		CP24-00101	005-950-730	1	For DB-1
		CP24-00141	005-952-330	1	For GVA-100
		CP24-00502	005-955-560	1	For GPA-017S/ GSC-00175
5	Accessories	FP14-02801	004-366-960	1	For FA-1502
6	Spare Parts	SP24-00101	-	1	For FA-1502

Optional supply

<table>
<tr><th>No.</th><th>Name</th><th>Type</th><th>Code no.</th><th colspan="2">Remarks</th></tr>
<tr><td>1</td><td>Monitor unit</td><td>FA-1502</td><td>-</td><td colspan="2"></td></tr>
<tr><td rowspan="2">2</td><td rowspan="2">Antenna cable set</td><td>CP20-02700</td><td>004-381-160</td><td colspan="2">8D-FB-CV(30m)+CP20-02701</td></tr>
<tr><td>CP20-02710</td><td>004-381-170</td><td colspan="2">8D-FB-CV(50m)+CP20-02701</td></tr>
<tr><td rowspan="2">3</td><td rowspan="2">Antenna cable set</td><td>CP24-00300</td><td>000-041-938</td><td colspan="2">8D-FB-CV(30m)+CP24-00301</td></tr>
<tr><td>CP24-00310</td><td>000-041-939</td><td colspan="2">8D-FB-CV(50m)+CP24-00301</td></tr>
<tr><td>4</td><td>Coaxial cable</td><td>TNC-PS-3D-15</td><td>000-133-670</td><td colspan="2">TNC-TNC, 15m</td></tr>
<tr><td>5</td><td>Mast mount fixture</td><td>CP20-01111</td><td>004-365-780</td><td colspan="2">For GSC-001</td></tr>
<tr><td>6</td><td>Right-angle antenna base</td><td>No.13-QA330</td><td>000-803-239</td><td colspan="2">For GSC-001</td></tr>
<tr><td>7</td><td>L-angle antenna base</td><td>No.13-QA310</td><td>000-803-240</td><td colspan="2">For GSC-001</td></tr>
<tr><td>8</td><td>Antenna base for rail mount</td><td>No.13-RC5160</td><td>000-806-114</td><td colspan="2">For GSC-001</td></tr>
<tr><td>9</td><td>Whip antenna</td><td>FAB-151D</td><td>000-572-029</td><td colspan="2">For Japan only</td></tr>
<tr><td>10</td><td>Antenna fixing bracket</td><td>4-310071</td><td>000-572-184</td><td colspan="2">For FAB-151D</td></tr>
<tr><td>11</td><td>Whip antenna</td><td>150M-W2VN</td><td>000-113-498</td><td colspan="2">For outside Japan</td></tr>
<tr><td>12</td><td>AC-DC power supply</td><td>PR-240</td><td>-</td><td colspan="2">Include installation materials CP24-00151*</td></tr>
<tr><td>13</td><td>Pilot plug</td><td>OP24-3</td><td>000-053-911</td><td colspan="2"></td></tr>
<tr><td>14</td><td>AD-100</td><td>AD-100</td><td>-</td><td colspan="2">For gyrocompass</td></tr>
<tr><td rowspan="5">15</td><td rowspan="5">Cable assy.</td><td>MJ-A10SPF 0012-050</td><td>000-150-216</td><td>5m</td><td rowspan="5">Transponder-display, connector attached at one end</td></tr>
<tr><td>MJ-A10SPF 0012-100</td><td>000-150-217</td><td>10m</td></tr>
<tr><td>MJ-A10SPF 0012-250</td><td>000-150-218</td><td>25m</td></tr>
<tr><td>MJ-A10SPF 0012-500</td><td>000-150-219</td><td>50m</td></tr>
<tr><td>MJ-A10SPF 0012-1000</td><td>000-150-220</td><td>100m</td></tr>
<tr><td rowspan="2">16</td><td>Flush mount kit S</td><td>OP20-17</td><td>000-040-720</td><td colspan="2" rowspan="2">For monitor unit</td></tr>
<tr><td>Flush mount kit F</td><td>OP20-29</td><td>000-041-405</td></tr>
<tr><td>17</td><td>ϕ 80 Mast mount kit</td><td>OP24-5</td><td>005-954-510</td><td colspan="2">For GVA-100</td></tr>
<tr><td>18</td><td>GPS antenna</td><td>GSC-001-FA-T</td><td>-</td><td colspan="2"></td></tr>
<tr><td>19</td><td>LAN kit</td><td>OP24-8</td><td>005-956-020</td><td colspan="2">See page 27.</td></tr>
<tr><td>20</td><td>UAIS display software</td><td>FAISPC MARK-2</td><td>005-860-470</td><td colspan="2"></td></tr>
<tr><td>21</td><td>AIS display software CD</td><td>FAISPC-MX-50</td><td>001-046-340</td><td colspan="2">LAN kit required</td></tr>
</table>

1. MOUNTING

NOTICE

Do not apply paint, anti-corrosive sealant or contact spray to coating or plastic parts of the equipment.

Those items contain organic solvents that can damage coating and plastic parts, especially plastic connectors.

1.1 Antenna Units

1.1.1 GPS antenna unit

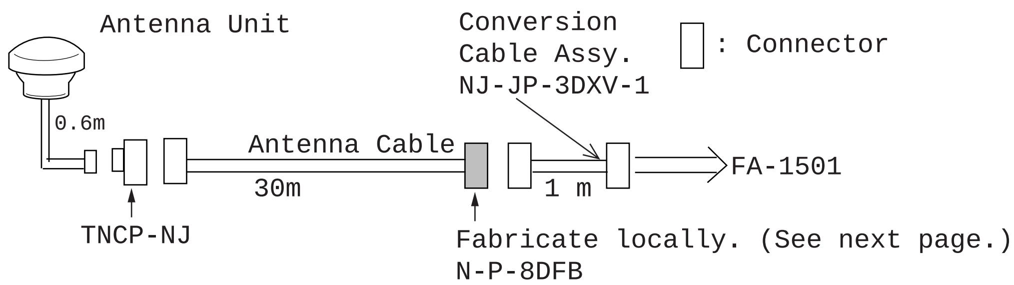
Install the GPS antenna unit referring to the drawing on page D-5 or D-6 at the back of this manual. When selecting a mounting location for the antenna, keep in mind the following points.

- Select a location out of the radar beam. The radar beam will obstruct or prevent reception of the GPS satellite signal.
- There should be no interfering object within the line-of-sight to the satellites. Objects within line-of-sight to a satellite, for example, a mast, may block reception or prolong acquisition time.
- Mount the antenna unit as high as possible to keep it free of interfering objects and water spray, which can interrupt reception of GPS satellite signal if the water freezes.

Extending antenna cable

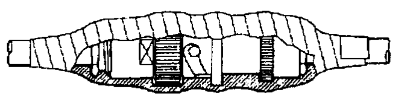
Three types of antenna cable extensions are optionally available.

a) Antenna cable set CP20-02700



◆ Waterproofing connector

Wrap connector with vulcanizing tape and then vinyl tape. Bind the tape end with a cable-tie.



Waterproofing connector

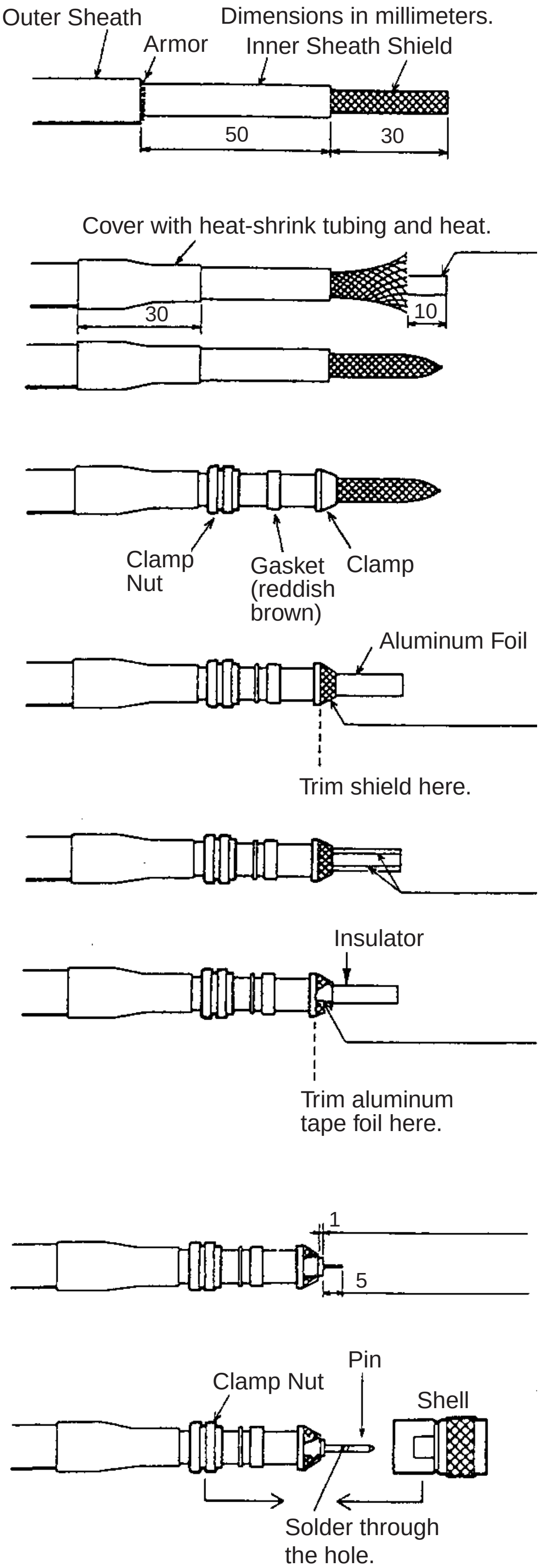
b) Antenna cable set CP20-02710 (8D-FB-CV, 50m)

Connect the cable the same as a) above.

c) Cable type RG-10/UY (shipyard supply)

Note: The length of this cable should be less than 20 m to prevent signal loss. The coax. coupling cable assy.(type: NJ-TP+3DXV-1, code no. 000-123-809), coaxial connector(N-P-8DFB; supplied), vulcanizing tape and vinyl tape are required. Fabricate both ends of the cable as shown in the figure on the next page.

How to attach the connector N-P-8DFB for cable 8D-FB-CV



Remove outer sheath and armor by the dimensions shown left.
Expose inner sheath and shield by the dimensions shown left.

Cut off insulator and core by 10mm.

Twist shield end.

Slip on clamp nut, gasket and clamp as shown left.

Fold back shield over clamp and trim.

Cut aluminum foil at four places, 90° from one another.

Fold back aluminum foil onto shield and trim.

Expose the insulator by 1mm.

Expose the core by 5mm.

Slip the pin onto the conductor. Solder them together through the hole on the pin.

Insert the pin into the shell. Screw the clamp nut into the shell.
(Tighten by turning the clamp nut. Do not tighten by turning the shell.)

How to attach connector N-P-8DFB

1.1.2 VHF antenna

Location

The location of the mandatory AIS VHF-antenna should be carefully considered. Digital communication is more sensitive than analog/voice communication to interference created by reflections in obstructions like masts and booms. It may be necessary to relocate the VHF radiotelephone antenna to minimize interference effects.

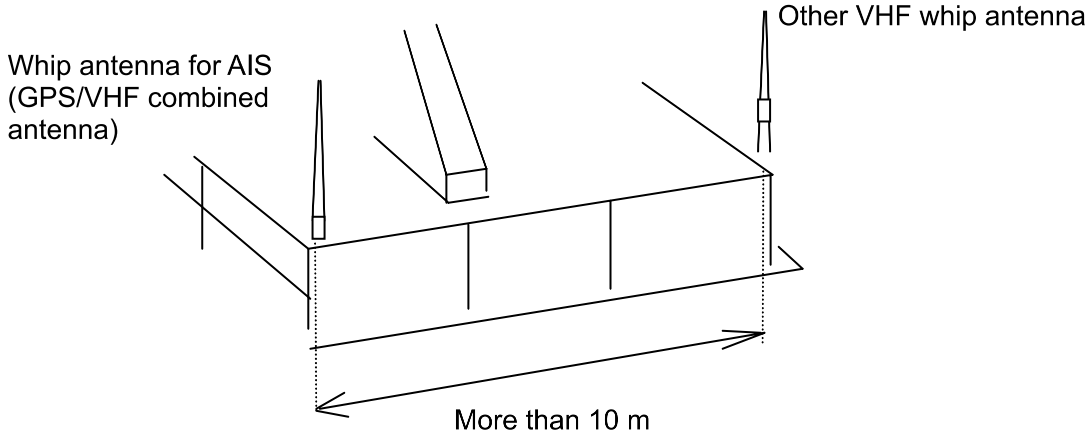
To minimise interference effects, the following guidelines apply:

- The AIS VHF antenna should be placed in an elevated position that is as free as possible with a minimum of 0.5 meters in the horizontal direction from constructions made of conductive materials. The antenna should not be installed close to any large vertical obstruction. The objective for the AIS VHF antenna is to see the horizon freely through 360 degrees.
- The AIS VHF antenna should be installed safely away from interfering high-power energy sources like radar and other transmitting radio antennas, preferably at least 3 meters away from and out of the transmitting beam.
- There should not be more than one antenna on the same plane. The AIS VHF antenna should be mounted directly above or below the ship's primary VHF radiotelephone antenna, with no horizontal separation and with a minimum of 2.8 meters vertical separation. If it is located on the same plane as other antennas, the distance apart should be at least 10 meters.

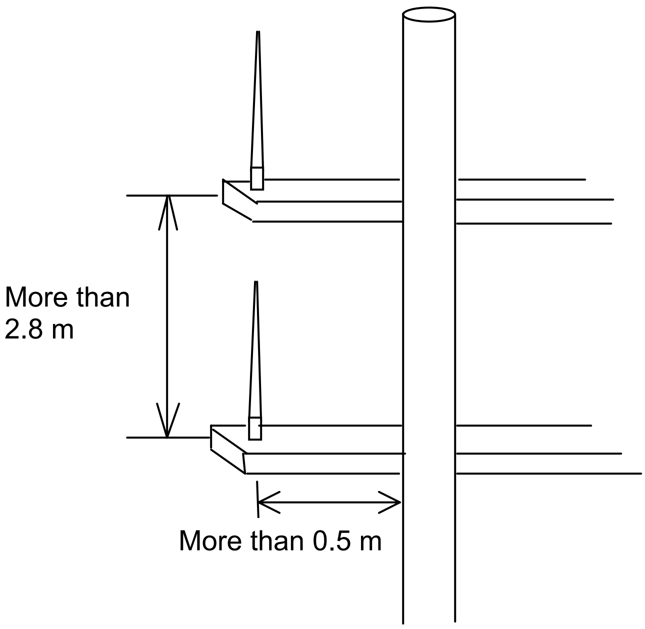
Cabling

- The cable should be kept as short as possible to minimize signal attenuation. Coaxial cables equal to or better than RG10U/Y are recommended.
- All outdoor-installed connectors on coaxial cables should be fitted with preventive isolation such as vulcanizing tape to protect against water penetration into the antenna cable.
- Coaxial cables should be installed in separate signal cable channels/tubes and at least 10 cm away from power supply cables. Crossing of cables should be done at right angles (90°). The minimum bend radius of the coaxial cable should be 5 times the cable's outer diameter.
- Install the VHF whip antenna referring to the outline drawing at the back of this manual. Separate this antenna from other VHF radiotelephone antennas as shown on the next page to prevent interference to the FA-150.

Horizontal separation distance



Vertical separation distance

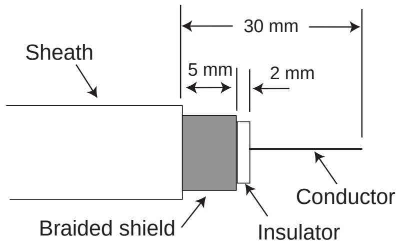


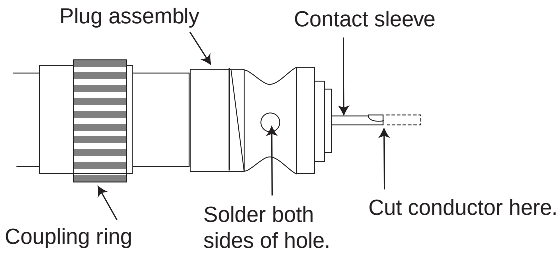
- When coaxial cable RG-10/UY (shipyard supply) is used, attach the coaxial plug M-P-7 (dockyard supply) as shown on the next page.

How to attach the plug M-P-7

Lay the coaxial cable and attach an M-type plug (if necessary) to the cable as follows.

1. Remove the sheath by 30 mm.
2. Bare 23 mm of the center conductor. Trim braided shield by 5 mm and tin.
3. Slide coupling ring onto cable.
4. Screw the plug assembly on the cable.
5. Solder plug assembly to braided shield through solder holes. Solder contact sleeve to conductor.
6. Screw coupling ring into plug assembly.

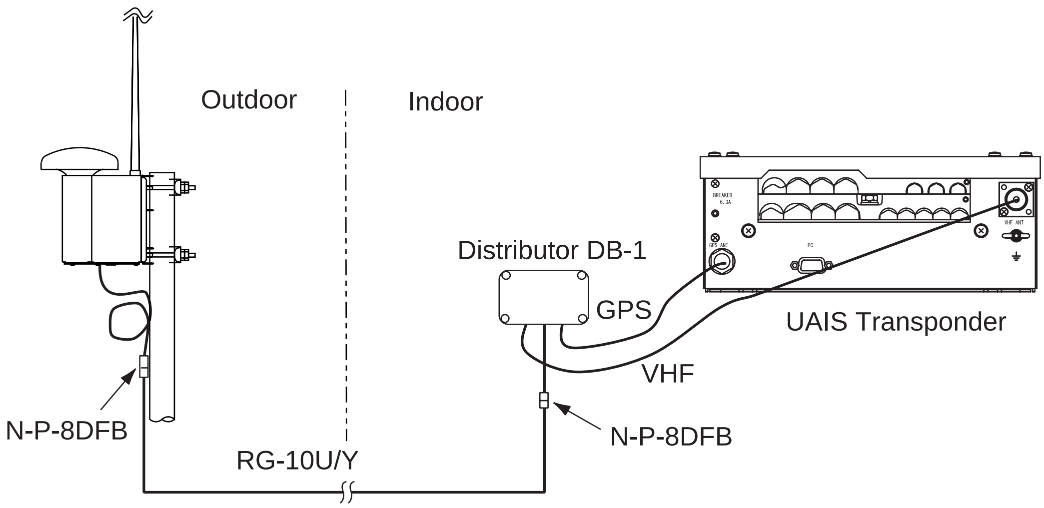




1.1.3 GPS/VHF combined antenna

Install the combined antenna unit referring to the outline drawing. When selecting a mounting location for the antenna, keep in mind the following points.

- Select a location out of the radar beam. The radar beam will obstruct or prevent reception of the GPS satellite signal.
- There should be no interfering object within the line-of-sight to the satellites. Objects within line-of-sight to a satellite, for example, a mast, may block reception or prolong acquisition time.
- Mount the antenna unit as high as possible. Mounting it this way keeps it free of interfering objects and water spray, which can interrupt reception of GPS satellite signal if the water freezes.
- Also, refer to the antenna installation guidelines page 3.

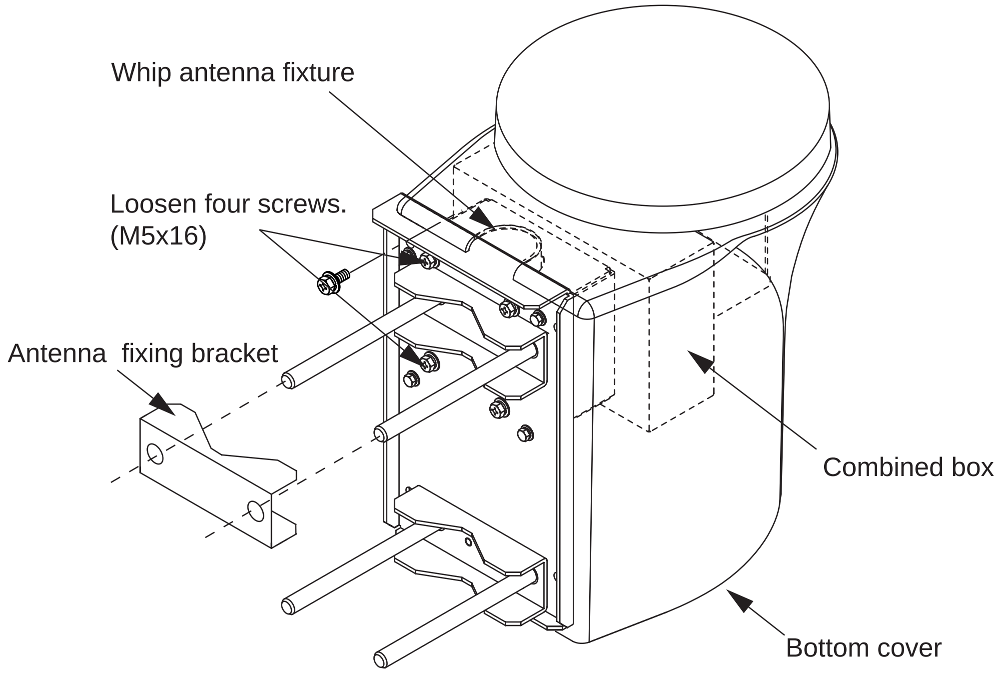


Installation overview of GPS/VHF combined antenna

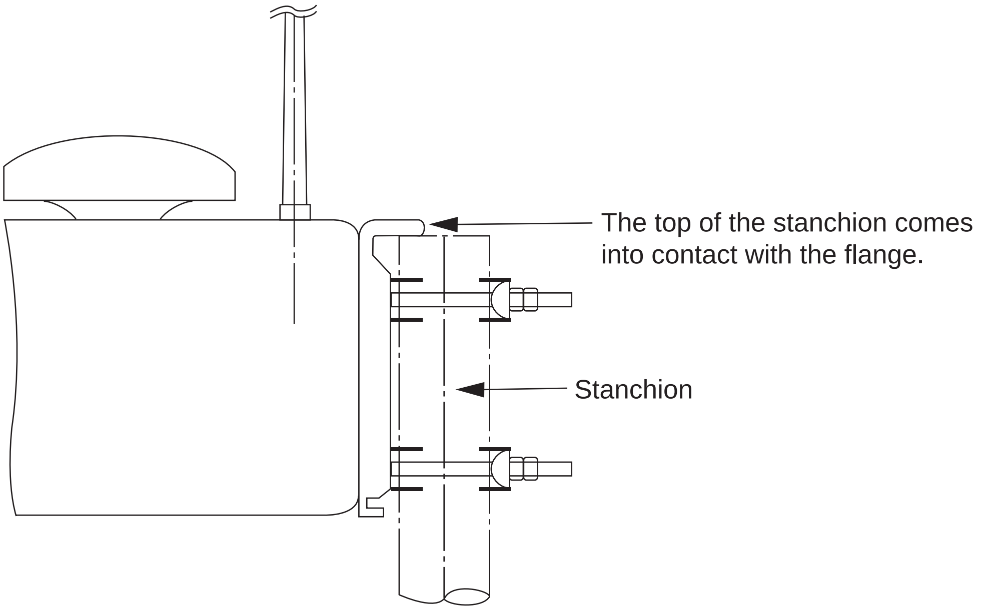
Mounting procedure

1. Dismount the bottom cover, cut the cable-tie inside the unit and take out the coaxial connector attached to the combined box.
2. Loosen four screws to loosen whip antenna fixture and pull out the coaxial connector coming from the combined box through the hole in the whip antenna fixture.
3. Connect the coaxial connector to the whip antenna base and wrap the junction part of the whip antenna with vulcanizing tape and then vinyl tape for waterproofing.
4. Insert the whip antenna from the top of the combined antenna.
5. Secure the whip antenna with whip antenna fixture.
6. Using a new plastic band (supplied), secure the cables and coaxial connector inside the antenna case.
7. Mount the bottom cover.
8. Fix the GPS/VHF combined antenna to the ship's stanchion (40 to 50 mm diameter) with antenna fixing brackets, flat washers and hex. nuts.

Note: Coat the exposed parts of bolts and nuts with silicon sealant.

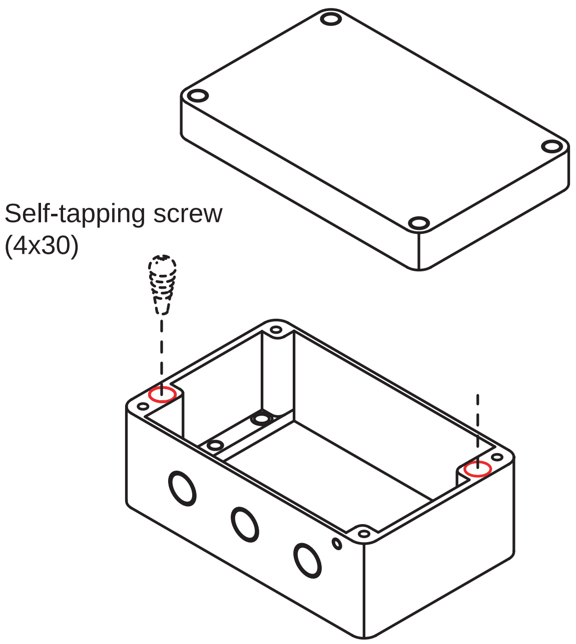


GPS/VHF Combined antenna



Installing distributor unit DB-1

The length of the cable between the distributor unit and transponder unit is 1 m so locate the distributor unit within 1 m from the transponder unit. Fix the distributor unit on the bulkhead, facing the cable entrance downward. Remove the lid of the distributor unit and secure the unit with two self-tapping screws.



Note: Be sure no foreign material or water enters the distributor unit.

1.2 Monitor Unit

The monitor unit can be installed on a desktop or flush mounted in a panel. Install it on the chart table or near the steering place, referring to the outline drawing.

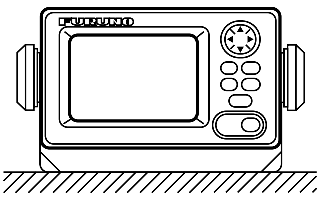
When selecting a mounting location for the monitor unit, keep the following in mind:

- Keep the unit out of direct sunlight.
- The temperature and humidity should be moderate and stable.
  (Operating temperature range: -15°C to +55°C)
- Locate the unit away from exhaust pipes and vents.
- The mounting location should be well ventilated.
- Mount the unit where shock and vibration are minimal.
- Keep the unit away from electromagnetic field generating equipment such as motor, generator.
- For maintenance and checking purposes, leave sufficient space at the sides and rear of the unit and leave slack in cables. Refer to the outline drawing.
- A magnetic compass will be affected if the unit is placed too close to it. Observe the following compass safe distances to prevent disturbance to the magnetic compass:

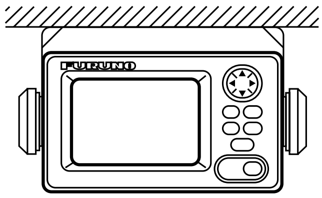
  Standard compass: 0.45 meters
  Steering compass: 0.3 meters

Desktop mounting

1. Fasten the hanger with four self-tapping screws (5x20).
2. Fasten the monitor unit to the hanger with two knobs.



Tabletop



Overhead

Flush mounting

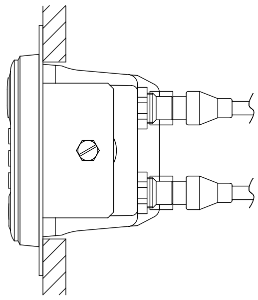
There are two types of flush mount kits, F type and S type. For details, see the outline diagrams at the back of this manual.

F type

Use the optional flush mount kit OP20-29.

Name	Type	Code No.	Qty
Cosmetic panel	20-016-1051	100-251-370-10	1
Self-tapping screw	5x20	000-162-609-10	4
Hexagon-head bolt	M6x12	000-162-897-10	2
Spring washer	M6	000-158-855-10	2

1. Prepare a cutout in the mounting location whose dimensions are 183 (W) x 92 (H) mm.
2. Attach the cosmetic panel (20-016-1051) to the unit with two hex head bolts (M6x12) and two spring washers (M6).
3. Fix the unit to the mounting location with four self-tapping screws (5x20).

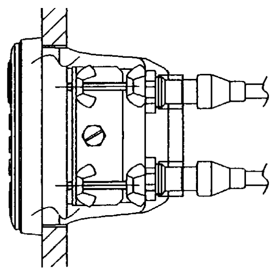


S type

Use the optional flush mount kit OP20-17.

.Name	Type	Code No.	Qty
Fixing plate	20-007-2401	100-183-190-10	2
Hexagon-head bolt	M6x12	000-162-897-10	2
Wing bolt	M4x30	000-804-799	4
Wing nut	M4	000-863-306	4
Spring washer	M6	000-158-855-10	2

1. Prepare a cutout in the mounting location whose dimensions are 167 (W) x 92 (H) mm.
2. Insert the unit to the cutout.
3. Attach two fixing plates (20-007-2401) to the unit with two hex bolts (M6x12) and two spring washers (M6).
4. Screw four wing bolts (M4x30) to wing nuts (M4).
5. Fasten the unit with four wing bolts and nuts.



1.3 UAIS Transponder

Mount the transponder, where it is protected from rain and water splash.
This unit can be installed on a bulkhead. Install it, referring to the outline drawing.

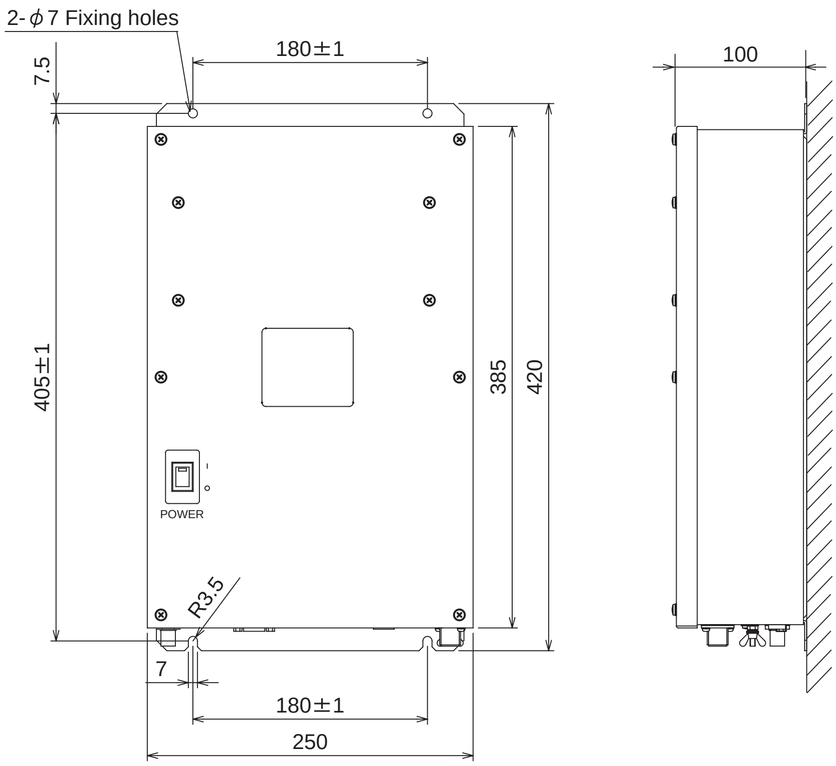
When selecting a mounting location for the transponder, keep the following in mind:

- Keep the transponder out of direct sunlight.
- The temperature and humidity should be moderate and stable. (Operating temperature range: -15°C to +55°C)
- Locate the unit away from exhaust pipes and vents.
- The mounting location should be well ventilated.
- Mount the unit where shock and vibration are minimal.
- Keep the unit away from electromagnetic field generating equipment such as motor, generator.
- For maintenance and checking purposes, leave sufficient space at the sides and rear of the unit and leave slack in cables. Refer to the outline drawing.
- A magnetic compass will be affected if the unit is placed too close to it. Observe the following compass safe distances to prevent disturbance to the magnetic compass:

  Standard compass: 1.2 meters
  Steering compass: 0.8 meters

Mounting

- Fix the unit with four self-tapping screws.

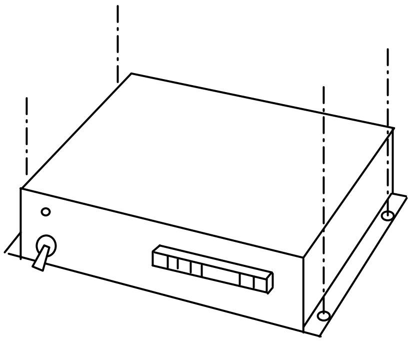


1.4 Power Supply (option)

When selecting a mounting location for the unit, keep the following in mind:

- Keep the unit out away from areas subject to water splash.
- Locate the unit away from exhaust pipes and vents.
- The mounting location should be well ventilated.
- Mount the unit where shock and vibration are minimal.
- A magnetic compass will be affected if the unit is placed too close to it. Observe the following compass safe distances to prevent disturbance to the magnetic compass:
    Steering compass: 0.6 m
    Standard compass: 0.9 m

Fix the unit with four self-tapping screws (4x16) to a desktop or the deck as shown in the figure below. It is not necessary to open the cover.



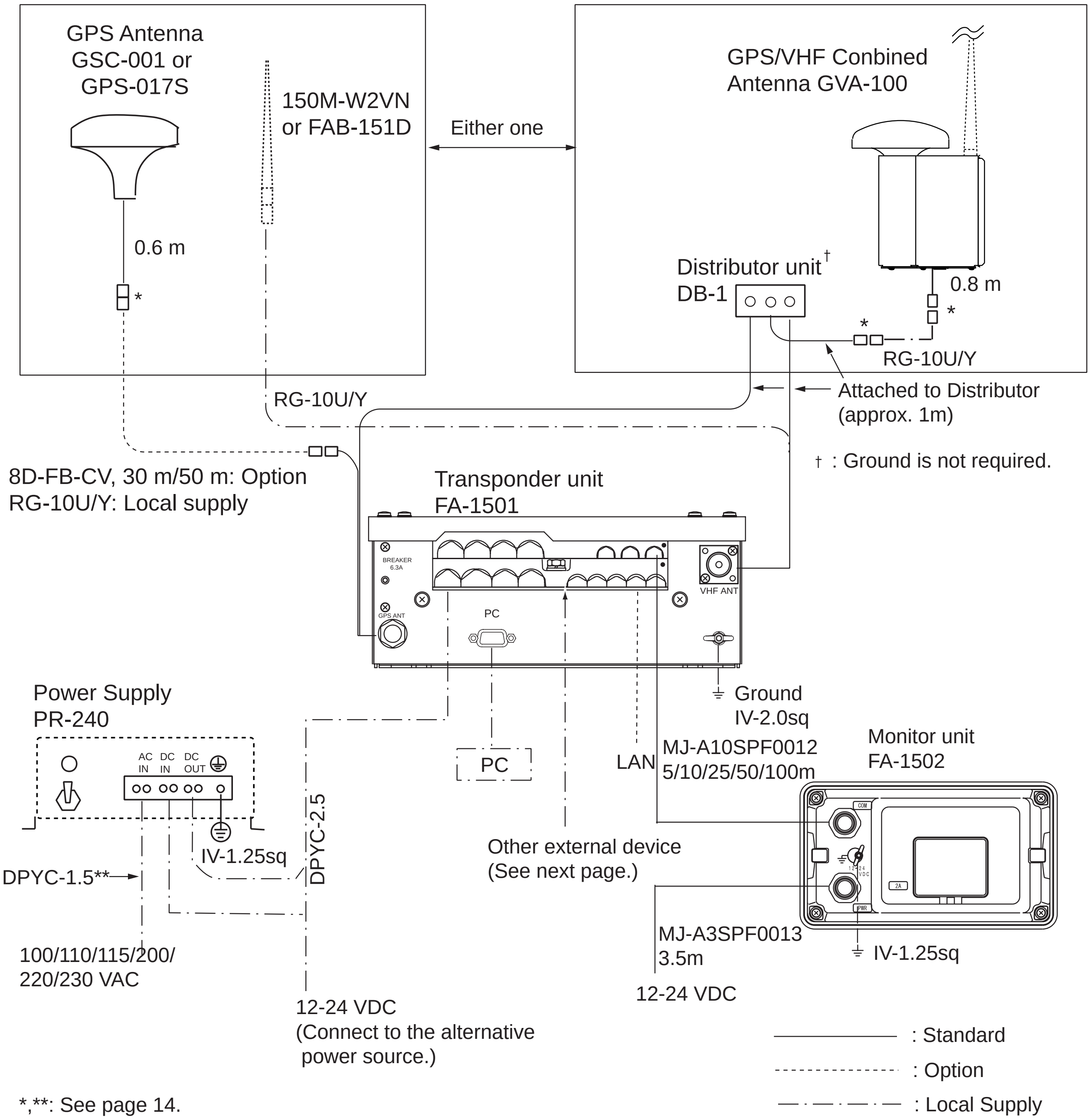
1.5 Pilot Plug (option)

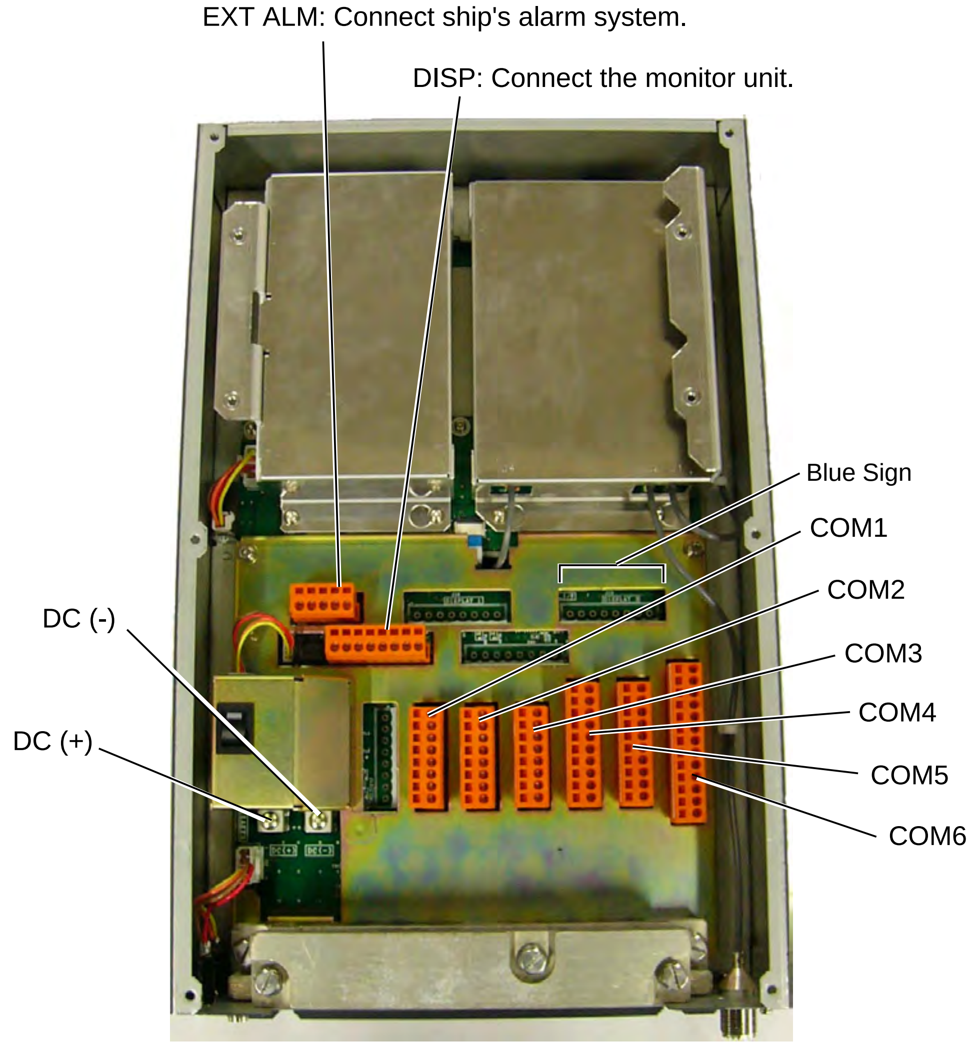
The pilot plug should be mounted near where the pilot steers the ship. This plug is used to connect a PC to display AIS information for use by the pilot. Refer to the outline drawing at the back of this manual for mounting dimensions.

2. WIRING

2.1 Connection

Connect the equipment, referring to the interconnection diagram at the back this manual.





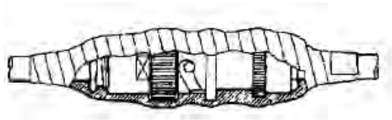
Internal ports of the Transponder

COM1: Long range communication device (Inmarsat C, etc.) or
External display (Radar, ECDIS, Pilotplug)
COM2 & COM3: External display, NAVNET 2, Pilot plug
COM4-COM6: GPS, Gyrocompass, Speedlog, ROT, etc.
Blue Sign: Connects a Blue Sign device, a lighting device mounted on the bridge which gives off a blue light to warn oncoming vessels when your vessel is navigating a channel in the reverse direction.

Note: A plastic sheet is placed across the cable glands of the transponder to keep out foreign material. Cut out holes in the plastic where cables are to be lead in.

*: Waterproofing connectors

Wrap connector with vulcanizing tape and then vinyl tape. Bind the tape end with a cable-tie.

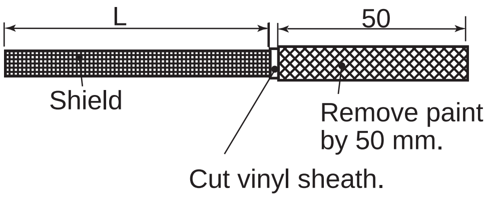


Waterproofing connector

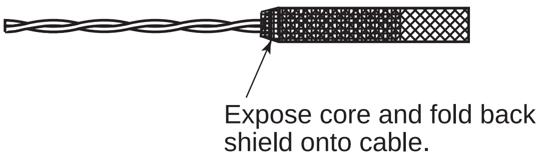
**: DPYC-2.5, TTYCS-1Q and TTYCS-4 are Japan Industry Standard cables.
Use them or the equivalents, referring to the Appendix.

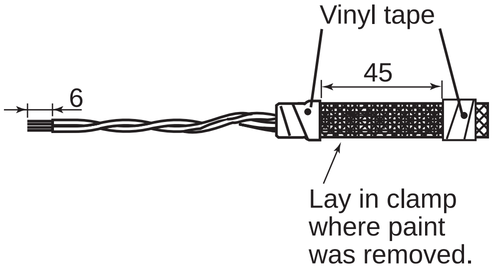
Cable connection at transponder

<u>Fabrication of cables TTYCS-4, TTYCS-1Q and TTYCS-1</u>



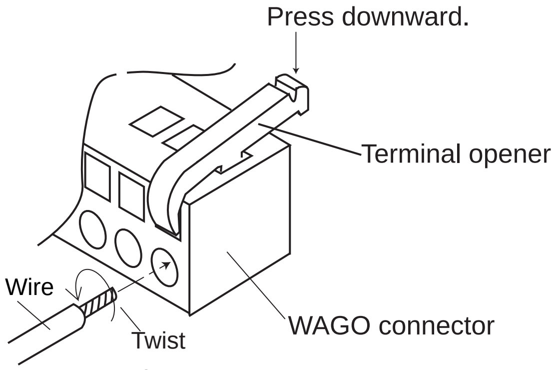
L: Depends on equipment connected.
Measure at the transponder.





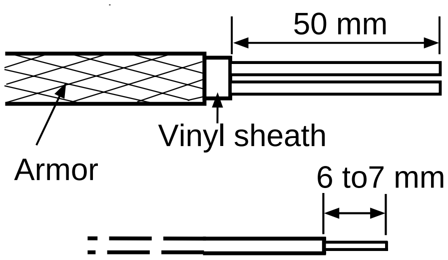
How to attach wires to the WAGO connector

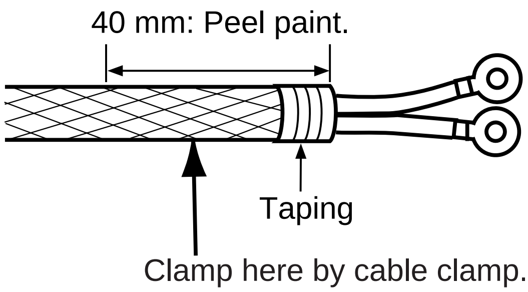
Wiring for WAGO connector



Procedure
1. Twist the cores.
2. Press the terminal opener downward.
3. Insert the wire to hole.
4. Remove the terminal opener.
5. Pull the wire to confirm that it is secure.

Fabrication of power cable DPYC-2.5

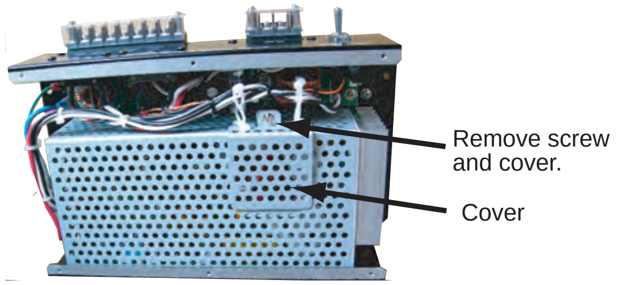


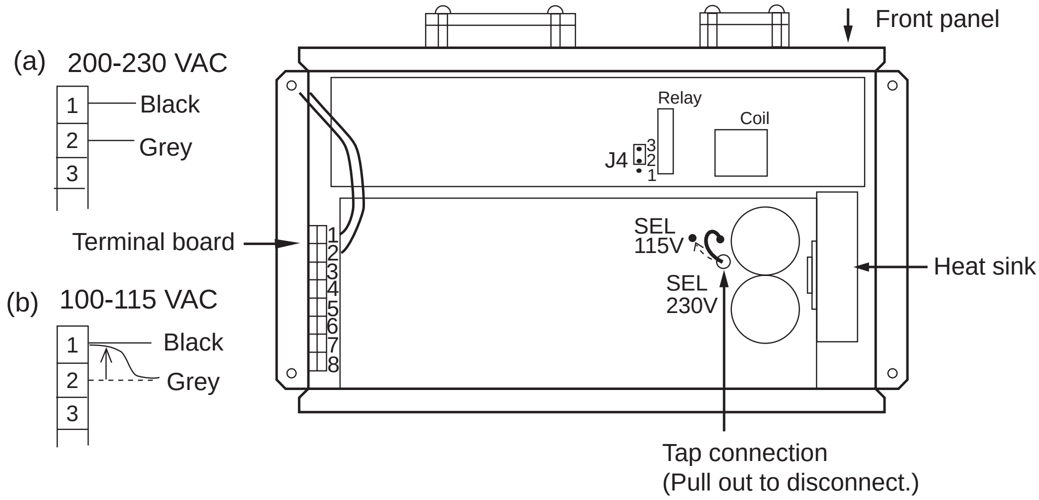


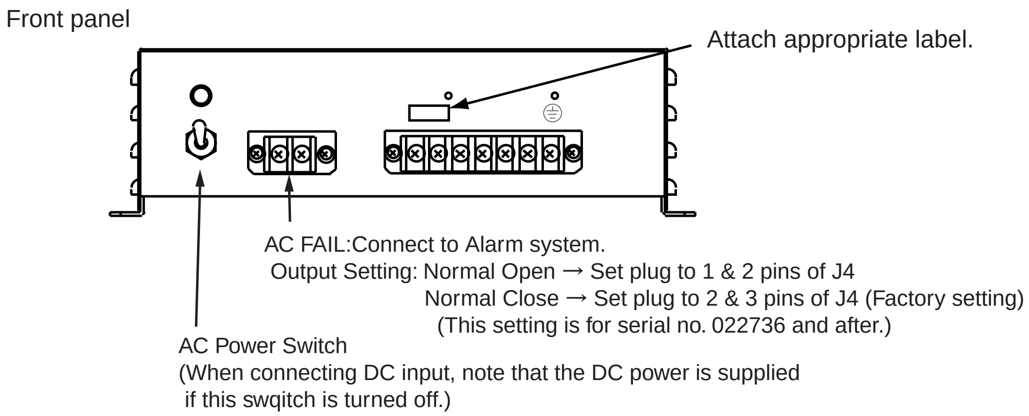
2.2 Changing Ship's Mains Specifications

The AC-DC power supply PR-240 is shipped ready for connection to a 200-230 VAC ship's mains. If the ship's mains is 100 VAC-115 VAC, change the tap connection and terminal board connection as below. Attach label supplied as accessories to the front panel according to the ship's mains.

Ship's mains	Tap connection	Terminal board	Label
AC200-230V	SEL 230 V	Below (a)	200-230 VAC 2.5-2.0 A 1 ϕ 50/60 Hz
AC100-115V	SEL 115 V	Below (b)	100-115 VAC 4.0-3.5 A 1 ϕ 50/60 Hz







Note: The DC output load must be less than 8A.

3. SETTING AND ADJUSTMENT

After installing the equipment, set up the own ship's static information (MMSI, IMO number, ship's name, call sign, type of ship and GPS antenna position). Also, set up the I/O ports.

3.1 Inland AIS Specific Settings

This section shows how to activate and set up the Inland AIS feature. (If you do not require this feature, go to section 3.2.) The installer obtains the AIS activation key from the place of purchase.

Entering activation key

Enter your key number to activate the Inland AIS.

1. Press the [MENU] key to open the menu.

```
[MENU]
MSG
SENSOR STATUS
INTERNAL GPS
USER SETTINGS
INITIAL SETTINGS
CHANNEL SETTINGS
DIAGNOSTICS
```

Main menu

2. Select DIAGNOTICS then press the [ENT] key.

```
[DIAGNOSTICS]
MONITOR TEST
TRANSPONDER TEST
PWR ON/OFF HISTORY
TX ON/OFF HISTORY
MEMORY CLEAR
ACTIVATE KEY
FOR SERVICE
```

DIAGNOSTICS sub-menu

3. Select ACTIVATE KEY then press the [ENT] key.
4. Press the [ENT] key, enter your activation key then press the [ENT] key.
5. Press the [MENU] key to quit.

If you entered the activation key correctly, the indication "ACTIVATED!" appears then the system is automatically restarted.

```
[ACTIVATE KEY]
DEVICE ID
    XX-XX-XX-XX-XX
KEY
    -  -  -

              QUIT[MENU]
```

ACTIVATE KEY sub-menu

Selecting AIS mode

The Inland AIS has two operating modes: Inland (inland waterways) and SOLAS (SOLAS compliant class A AIS transponder). Select INLAND AIS mode as follows:

1. Press the [NAV STATUS] key to open the NAV STATUS menu.

```
[NAV STATUS]              ▶
NAV STATUS:              15
AID MODE:             SOLAS
***STATUS DETAIL***
   NOT DEFINED
      (DEFAULT)
```

NAV STATUS menu (initial sub-menu)

2. Push ▼ to select AIS MODE then press the [ENT] key.

```
SOLAS
INLAND
```

3. Select INLAND (Inland AIS) then press the [ENT] key.

You are asked if you are sure to reboot the system. Press◄ to select YES then press the [ENT] key to reboot.

Setting blue sign status

Blue sign (a day-sign), which in combination with a white flashing light, must be shown if you are sailing on the port-side shore (against traffic direction).

1. Press the [MENU] key to open the menu.

```
[MENU]
MSG
SENSOR STATUS
INTERNAL GPS
USER SETTINGS
INITIAL SETTINGS
CHANNEL SETTINGS
DIAGNOSTICS
```

Main menu

2. Press ▼ on the cursor pad to select INITIAL SETTINGS and press the [ENT] key. The password entry window appears.

```
[ENTER PASSWORD]
-------------
```

Password entry window

3. Enter the password to show the INITIAL SETTINGS menu. Note that the password is known by only the FURUNO dealer.

```
[INITIAL SETTINGS]
SET MMSI
SET INT ANT POS.
SET EXT ANT POS.
SET SHIP TYPE
SET I/O PORT
SET BLUE SIGN SW
                QUIT [MENU]
```

INITIAL SETTINGS menu

4. Select SET BLUE SIGN SW then press the [ENT] key.

```
[SET BLUE SIGN SW]
SET BLUE SIGN SW
          NOT AVAILABLE

                QUIT [MENU]
```

SET BLUE SIGN SW sub-menu

5. NOT AVAILABLE is selected; press the [ENT] key.

```
NOT AVAILABLE
AVAILABLE
```

6. Select NOT AVAILABLE (not in use) or AVAILABLE (in use) as applicable then press the [ENT] key.

3.2 Setting MMSI, IMO No., Name and Call Sign

1. Display the INITIAL SETTINGS menu referring to step 1-3 in "Setting blue sign status" on page 18 - 19.

```
[INITIAL SETTINGS]
SET MMSI
SET INT ANT POS.
SET EXT ANT POS.
SET SHIP TYPE
SET I/O PORT
SET BLUE SIGN SW  <-- Appears for Inland AIS only
                QUIT [MENU]
```

INITIAL SETTINGS menu

2. SET MMSI is selected; press the [ENT] key to display the SET MMSI window.

```
[SET MMSI]
MMSI: 000000000
IMO NO.: 000000000
NAME:

CALL SIGN:

                QUIT [MENU]
```

SET MMSI (Class A)

```
[SET MMSI]
MMSI: 000000000
NAME:

CALL SIGN:
IMO NO.: 000000000
ENI:  00000000
                QUIT [MENU]
```

SET MMSI (Inland AIS)

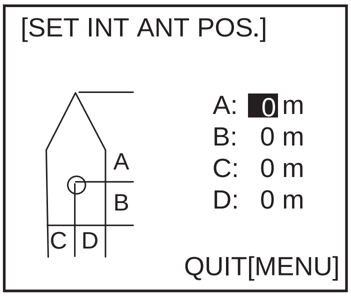
SET MMSI sub-menu

3. MMSI is selected; press the [ENT] key. Use the cursor pad to set MMSI no., in nine digits, as follows:
   a) The cursor is selecting the 1st digit place of the MMSI no. Press ▲ or ▼ to select the 1st digit of the number. Pressing ▲ displays alphanumeric characters cyclically in order of blank space, alphabet, numerals and symbols.
   b) Press ► to shift the cursor to the adjacent place, then use ▲ or ▼ to select the 2nd digit.
   c) Repeat steps a) and b) to finish entering the number. To erase a character, insert a space.
   d) After entering all digits, press the [ENT] key to register input.
4. Enter IMO number, name of your vessel and call sign, similar to how you entered MMSI. **For the Inland AIS,** additionally enter ENI no.
   IMO: Nine digits. If the IMO number has 7 digits, enter “0” twice followed by IMO number. If the ship has no IMO number, enter nine zeroes.
   ENI: Eight digits
5. After entering data, press the [MENU] key to close the menu.

Note: If you enter incorrect data, do the procedure from step 1.

3.3 Setting GPS Antenna Position

1. Open the INITIAL SETTINGS window, referring to step 1-3 in "Setting blue status" on page 18 - 19.
2. Press ▲ or ▼ key to choose SET INT ANT POS. and press the [ENT] key.



SET INT ANT POS. sub-menu
(Data entry)

3. Press the [ENT] key again.
4. Use the cursor pad to enter the distance for “A” of the FA-150 GPS antenna then press the [ENT] key.
   A: Distance from bow to GPS antenna position, setting range: 0-511 m
5. Press the [ENT] key and enter distance for B, C and D, similar to how you did for "A" above.
   B: Distance from stern to GPS antenna position, setting range: 0-511 m
   C: Distance from port to GPS antenna position, setting range: 0-63 m
   D: Distance from starboard to GPS antenna position, the setting range: 0-63 m
6. Press the [MENU] key to return to the INITIAL SETTINGS menu.
7. Press ▲ or ▼ key to choose SET EXT ANT POS and press the [ENT] key.
8. Enter distance for location of an external GPS antenna (if connected) similar to how you did for the internal GPS antenna.
9. Finally press the [MENU] key to save the settings.

Notes

- Use "Length Over All" (not "Length Between Perpendicular") to express the dimensions for A and B.
- The sum of A+B (Length Over All) must be the same for both INT ANT POS. and EXT ANT POS.
- The sum of C+D (Width) must be the same for both INT ANT POS. and EXT ANT POS.

3.4 Setting Ship Type

1. In the INITIAL SETTINGS window, press the ▲ or ▼ key to choose the SET SHIP TYPE and press the [ENT] key.

```
[SET SHIP TYPE]
TYPE NO :          0*

* * * * TYPE DETAIL * * * *
NOT AVAILABLE
```

2. Press the [ENT] key and set number for ship type by using ▲ or ▼ key, referring to the table below.

Table: Ship type

No.	Ship type
1	Future use
2	WIG
3	Vessel
4	HSC
5	Special craft
6	Passenger ships
7	Cargo ships
8	Tanker
9	Other type of ship

WIG: Wing in ground

HSC: High speed craft

(For details, see “§1.5 Setting Up for Voyage” on the operator’s manual.)

3. Press the [MENU] key to save the setting.

3.5 Setting I/O Port

Setting COM port/PC port

1. In the INITIAL SETTINGS window, press ▲ or ▼ key to choose the SET I/O PORT and press the [ENT] key.

```
[SET I/O PORT]
SET COM PORT
SET PC PORT
SET LAN PORT*1
SET PRIORITY
SET QUALITY*2
                    QUIT[MENU]
```

*1 Shown if fitted with LAN kit (option).
*2 Shown if Inland AIS is incorporated.

SET I/O PORT menu

2. SET COM PORT is selected; press the [ENT] key.

3. Select an appropriate port among COM1, COM2, COM3, COM4, COM5 and COM6.

   If you chose COM1, for example, do as follows.
4. Press the [ENT] key to display the COM1 setting window.

```
[SET COM1]
MODE  :  LONG RANGE
SPEED:   IEC 61162-2




                    QUIT [MENU]
```

5. Press the [ENT] key again to display the MODE setting window.

```
[SET COM1]
MODE  :  LONG RANGE
SPEED:  LONG RANGE
         EXT DISPLAY
         DISABLE

                    QUIT [MENU]
```

6. Press ▲ or ▼ to choose the device connected and press the [ENT] key.
   LONG RANGE: Long range communication device, for ex. Inmarsat C.
   EXT DISPLAY: External display, for ex. Radar, ECDIS, Pilotplug, etc.
   DISABLE: When the port is not used.
7. Press the [ENT] key to display the SPEED setting window.

```
[SET COM1]
MODE  :  LONG RANGE
SPEED:   IEC 61162-2
         IEC 61162-1
         IEC 61162-2

                    QUIT [MENU]
```

8. Press ▲ or ▼ to choose the data format, or data transmission rate.
   IEC61162-1: 4800 bps
   IEC61162-2: 38.4 Kbps
9. Press the [ENT] key.
10. Press the [MENU] key to save the settings.
11. Set up other ports similarly.
12. Set PC PORT similar to how you did for the COM PORT.

The table below shows the ports and corresponding items to be set.

Port and data format/data transmission rate

Port	External device (MODE)	Format/Rate (SPEED)
COM1	LONG RANGE	IEC61162-1, IEC61162-2
	EXT DISPLAY	IEC61162-1, IEC61162-2
	DISABLE	-
COM2	EXT DISPLAY	IEC61162-1, IEC61162-2
	MONITOR	IEC61162-1 (No use) IEC61162-2
	HI LEVEL IF	IEC61162-1 (No use) IEC61162-2
	DISABLE	-
COM3	EXT DISPLAY	IEC61162-1, IEC61162-2
	MONITOR	IEC61162-1 (No use) IEC61162-2
	HI LEVEL IF	IEC61162-1 (No use) IEC61162-2
	DISABLE	-
COM4	SENSOR	IEC61162-1, IEC61162-2
	EXT DISPLAY	IEC61162-1, IEC61162-2
	DISABLE	-
COM5	SENSOR	IEC61162-1, IEC61162-2
COM6	SENSOR	IEC61162-1, IEC61162-2 AD-10
PC	STANDARD	4800bps, 9600bps 19.2kbps, 38.4kbps, 57.6kbps
	MONITOR	4800bps, 9600bps 19.2kbps, 38.4kbps, 57.6kbps
	SERVICE	4800bps, 9600bps 19.2kbps, 38.4kbps, 57.6kbps
	BEACON	4800bps
	DISABLE	-

Note: Underline shows default.

LONG RANGE: Long range communication device, for ex. Inmarsat C.
EXT DISPLAY: External display, for ex. Radar, ECDIS, Pilotplug, etc.
SENSOR: GPS, Gyrocompass, Speedlog, ROT, etc.
HI LEVEL IF: NAVNET 2
STANDARD (PC port): PC for inputting NMEA data (Same data as EXT DISPLAY).
MONITOR (PC port): PC having the FURUNO software FAISPC MK-2.
SERVICE (PC port): Service use FAISPC MK-2-equipped PC.

Priority setup

1. Press ▲ or ▼ to choose SET PRIORITY at the SET I/O PORT sub-menu and press the [ENT] key.

```
[SET PRIORITY]
L/L, COG, SOG
HDG
ROT

QUIT [MENU]
```

PRIORITY menu

2. "L/L, COG, SOG" is selected; press the [ENT] key.

```
[SET L/L, COG, SOG]
COM4: 1
COM5: 2
COM6: 3

QUIT [MENU]
```

3. COM4 is selected; press the [ENT] key to display the setting window.

```
1
2
3
```

4. Choose the priority level for the COM4 port (position, course over ground and speed over ground data) and press the [ENT] key.
   "1" is the highest and "3" is the lowest.
5. Set the priority of COM5 and COM6 similarly.

Note: Do not set same number among COM4, COM5 and COM6.

6. Press the [MENU] key to return to the SET PRIORITY menu.
7. Press ▲ or ▼ to choose HDG and press the [ENT] key.
8. Set the priority for heading data similar to how you did for “L/L, COG, SOG”.
9. Press ▲ or ▼ to choose ROT and press the [ENT] key.
10. Set the priority for rate-of-turn data similarly.
11. Press the [MENU] key several times to save the settings.

Quality setup (Inland AIS only)

If your speed, course or heading sensor is type approved, choose quality setting as shown below.

1. Press▼ to choose SET QUALITY at the SET I/O PORT sub-menu then press the [ENT] key.

```
[SET QUALITY]
SPEED          : LOW
COURSE         : LOW
HEADING        : LOW



                QUIT[MENU]
```

2. Press ▲ or ▼ to choose SPEED, COURSE or HEADING then press the [ENT] key.

```
LOW
HIGH
```

3. Choose LOW or HIGH (quality index) applicable then press the [ENT] key.
4. Press the [MENU] key several times to save the settings.

4. ATTACHING LAN KIT (OPTION)

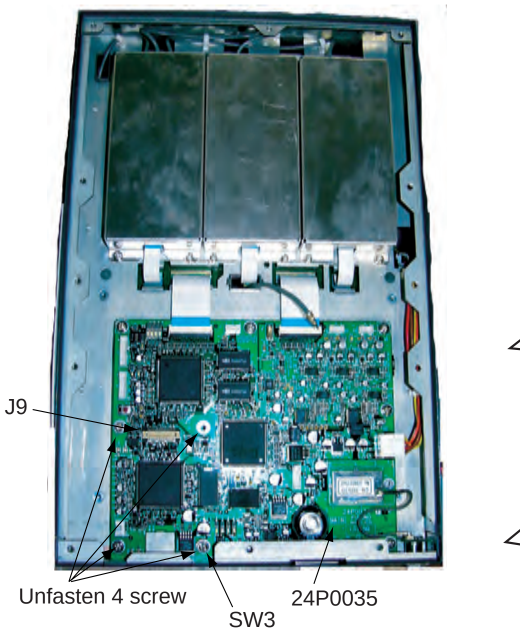
To connect to PC network or NAVNET 3D network, the optional LAN kit is required.

Name: LAN kit
Type: OP24-8
Code no.: 005-956-020

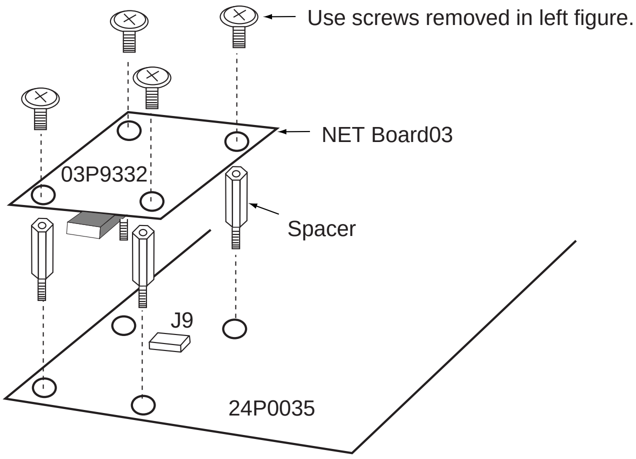
	Name	Code no.	Qty	Remark
1	NET100 board	008-535-840	1	03P9332
2	Hex. spacer	000-801-678	4	

Attaching

1. Dismount the bottom cover.
2. Attach NET100 board 03P9332 to the 24P0035 board, referring to the figure shown below.



Transponder (Bottom cover removed)



Attaching 03P9332

3. Set DIP switch SW3 #4 as follows.
   - For NAVNET 3D network: SW3 #4 OFF (default)
   - For PC network: SW3 #4 ON

Setting LAN port for PC network

1. Press the [MENU] key, choose INITIAL SETTING, enter password, choose SET I/O PORT and press the [ENT] key to show the SET I/O PORT sub menu.
2. Press ▲ or ▼ to choose SET LAN PORT and press the [ENT] key.

```
[SET LAN PORT]
MODE : STANDARD
IP ADDRESS
 172. 031. 024. 001
SUB NET MASK
 255. 255. 000. 000
PORT NO. : 10000
                QUIT [MENU]
```

3. Press the [ENT] key to show the mode selecting window.
4. Press ▲ or ▼ to choose suitable mode and press the [ENT] key.
   STANDARD: When connecting a LAN device
   MONITOR: When connecting a monitor
   SERVICE: Data output for service man
   DISABLE: No connection
5. Press the [ENT] key, enter IP address in the IP ADDRESS field and press the [ENT] key. (Setting range: 000.000.000.000 to 255.255.255.255)
   Choose digit with ◄ or ►; set value with ▲ or ▼.
6. Press the [ENT] key, enter sub net mask in the SUB NET MASK field and press the [ENT] key. (Setting range: 000.000.000.000 to 255.255.255.255)
7. Press the [ENT] key, enter port number in the PORT NO. field and press the [ENT] key. (Setting range: 0 to 65535)
8. Press the [MENU] key several times to save the settings and close the menu.

Setting LAN port for NAVNET 3D network

1. Press the [MENU] key, choose INITIAL SETTING, enter password, choose SET I/O PORT and press the [ENT] key to show the SET I/O PORT sub menu.
2. Press ▲ or ▼ to choose SET LAN PORT and press the [ENT] key.

```
[SET LAN PORT]        1/2
IP ADDRESS
     172. 031. 024. 001
SUB NET MASK
     255. 255. 000. 000
NAVNET PORT NO.
     10000
```

3. Press the [ENT] key, enter IP address in the IP ADDRESS field and press the [ENT] key. (Setting range: 000.000.000.000 to 255.255.255.255) Choose digit with ◄ or ►; set value with ▲ or ▼.

4. Press the [ENT] key, enter sub net mask in the SUB NET MASK field and press the [ENT] key. (Setting range: 000.000.000.000 to 255.255.255.255)
5. Press the [ENT] key, enter port number in the NAVNET PORT NO. field and press the [ENT] key. (Setting range: 10000 to 30000)
6. Press▼ to show next page.

```
[SET LAN PORT]        2/2
GATEWAY ADDRESS
     000. 000. 000. 000
HOST NAME  : AISO
AISOUTPUT   : CONTINUOUS
GPSOUTPUT : AUTO
ZDAOUTPUT : AUTO
```

7. Press the [ENT] key, enter gateway address in the GATEWAY ADDRESS field and press the [ENT] key. (Setting range: 000.000.000.000 to 255.255.255.255)
8. At the HOST NAME field, enter host name that is used in the NAVNET 3D(Setting range: AIS 0 to AIS 9) .
9. At the AIS OUTPUT field, set output condition.
   AUTO: Auto-detect of where to output AIS data.
   CONTINUOUS: AIS Output AIS data continuously.
10. At the GPS OUTPUT field, set GPS data (L/L, SOF, COG) output condition between AUTO and CONTINUOUS.
11. At the ZDA OUTPUT field, set time data output condition between AUTO and CONTINUOUS.
12. Press the [MENU] key several times to save the settings and close the menu.

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5. IEC 61162-1/2 DATA SENTENCES

IEC 61162-1/2 format data is input or output from the data port COM1-COM6. The table below shows the input/output data specifications.

Transponder

Port	Menu setting	Input/Output	Data format
COM1	LONG RANGE	Input/Output*	IEC61162-2 (38.4kbps) / IEC61162-1 (4800bps)
	EXT DISPLAY	Input/Output*	IEC61162-2 (38.4kbps) / IEC61162-1 (4800bps)
COM2	EXT DISPLAY	Input/Output*	IEC61162-2 (38.4kbps) / IEC61162-1 (4800bps)
COM3	EXT DISPLAY	Input/Output*	IEC61162-2 (38.4kbps) / IEC61162-1 (4800bps)
COM4	SENSOR	Input*	IEC61162-2 (38.4kbps) / IEC61162-1 (4800bps)
	EXT DISPLAY	Input/Output*	IEC61162-2 (38.4kbps) / IEC61162-1 (4800bps)
COM5	SENSOR	Input*	IEC61162-2 (38.4kbps) / IEC61162-1 (4800bps)
COM6	SENSOR	Input*	IEC61162-2 (38.4kbps) / IEC61162-1 (4800bps) AD-10

*: See next page for details.

Input data/Sentences

Sentence (Priority)	Contents
ABM	Addressed binary and safety related message
ACA	AIS regional channel assignment message
ACK	Acknowledge alarm
AIR	AIS interrogation request
BBM	UAIS broadcast binary message
VSD	UAIS voyage static data
LRI LRF	Long Range interrogation Long Range function
DTM	Datum reference
GNS>GLL>GGA>RMC	Position
VBW>RMC>VTG>OSD	Speed over ground
RMC>VTG>OSD	Course over ground
HDT>OSD>AD-10 format	Heading
GBS	GNSS satellite fault detection
ROT>Calculated value	Rate of turn
SSD	UAIS ship static data

Output data/Sentences

Sentence	Contents
AIVDM	VHF data-link message
AIVDO	UAIS VHF data-link own-vessel report
AIABK	UAIS addressed and binary broadcast acknowledgement
AILRF AILR1 AILR2 AILR3	Long-range function Long-range reply with destination for function request “A” Long-range reply for function requests “B, C, E and F” Long-range reply for function requests “I, O, P, U and W”
AIACA	AIS regional channel assignment message
AIALR	Set alarm state
AITXT	Text transmission
AIACS	Channel management information source

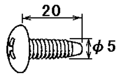
Inland AIS specific sentences

Sentence	Contents
Input	
PIWWIVD	Inland waterway voyage data
PIWWSPW	Inland AIS security password
PIWWSSD	Inland waterway static ship data
PIWWVSD	Inland waterway voyage data
Output	
PIWWSPR	Inland AIS security password response

FURUNO

CODE NO.	005-956-010-00	24AC-X-9402 -2
TYPE	CP24-00501	1/1

工事材料表
INSTALLATION MATERIALS

番 号 NO.	名 称 NAME	略 図 OUTLINE	型名／規格 DESCRIPTIONS	数量 Q'TY	用途／備考 REMARKS
1	+トラスタッピンネジ 1シュ SELF-TAPPING SCREW		5X20 SUS304 CODE NO. 000-162-608-10	4	

型式/コード番号が２段の場合、下段より上段に代わる過渡期品であり、どちらかが入っています。　なお、品質は変わりません。

TWO TYPES AND CODES MAY BE LISTED FOR AN ITEM. THE LOWER PRODUCT MAY BE SHIPPED IN PLACE OF THE UPPER PRODUCT. QUALITY IS THE SAME.

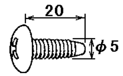
（略図の寸法は、参考値です。　DIMENSIONS IN DRAWING FOR REFERENCE ONLY.）

FURUNO ELECTRIC CO ., LTD.　　24AC-X-9402

FURUNO

CODE NO.	005-955-940-00	24AC-X-9405 -2
TYPE	CP14-06001	1/1

工事材料表
INSTALLATION MATERIALS

番 号 NO.	名 称 NAME	略 図 OUTLINE	型名／規格 DESCRIPTIONS	数量 Q'TY	用途／備考 REMARKS
1	+トラスタッピンネジ 1シュ SELF-TAPPING SCREW		5X20 SUS304 CODE NO. 000-162-608-10	4	

型式/コード番号が２段の場合、下段より上段に代わる過渡期品であり、どちらかが入っています。　なお、品質は変わりません。

TWO TYPES AND CODES MAY BE LISTED FOR AN ITEM. THE LOWER PRODUCT MAY BE SHIPPED IN PLACE OF THE UPPER PRODUCT. QUALITY IS THE SAME.

（略図の寸法は、参考値です。　DIMENSIONS IN DRAWING FOR REFERENCE ONLY.）

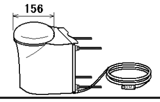
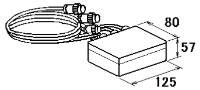
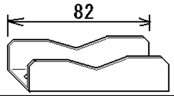
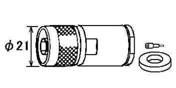
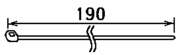
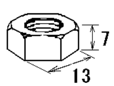
FURUNO ELECTRIC CO ., LTD.　　24AC-X-9405

PACKING LIST

24AA-X-9855 -2　1/1

A-3

GVA-100(GVA用)

NAME	OUTLINE	DESCRIPTION/CODE No.	Q'TY
ユニット　UNIT			
複合空中線部 GPS/VHF COMBINED ANTENNA		GVA-100 000-053-810-00	1
分配器 DISTRIBUTER UNIT		DB-1 000-053-854-00	1
工事材料　INSTALLATION MATERIALS		CP24-00141	
ｱﾝﾃﾅ取付金具 ANTENNA FIXING BRACKET		24-003-3015-0 100-302-670-00	2
ｺﾈｸﾀ(N) CONNECTOR		N-P-8DFB　座金 000-140-463-00	2
ｺﾝﾍﾞｯｸｽ PLASTIC BAND		CV-200HT CV-200HT 000-162-191-10 000-809-226-00	2
ﾐｶﾞｷ平座金 FLAT WASHER		M8 SUS304 000-864-130-00	4
六角ﾅｯﾄ　1種 HEX.NUT		M8 SUS304 000-863-110-00	8

型式/ｺｰﾄﾞ番号が2段の場合、下段より上段に代わる過渡期品であり、どちらかが入っています。 なお、品質は変わりません。

TWO TYPES AND CODES MAY BE LISTED FOR AN ITEM. THE LOWER PRODUCT MAY BE SHIPPED IN PLACE OF THE UPPER PRODUCT. QUALITY IS THE SAME.

(略図の寸法は、参考値です。 DIMENSIONS IN DRAWING FOR REFERENCE ONLY.)

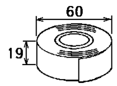
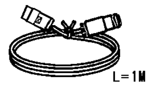
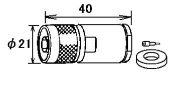
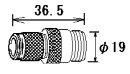
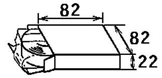
24AA-X-9855

A-4

FURUNO

CODE NO.	005-955-560-00	24AC-X-9403 -3
TYPE	CP24-00502	1/1

工事材料表
INSTALLATION MATERIALS

番号 NO.	名称 NAME	略図 OUTLINE	型名／規格 DESCRIPTIONS	数量 Q'TY	用途／備考 REMARKS
1	ﾋﾞﾆｰﾙﾃｰﾌﾟ NO360 VINYL TAPE		0.2X19X10000 ｸﾛ ｴｽﾛﾝ CODE NO. 000-835-215-00	1	
2	変換ｹｰﾌﾞﾙ組品 CONVERT CABLE ASSY.		NJ-TP-3DXV-1 CODE NO. 000-123-809-00	1	
3	ｺﾈｸﾀ CONNECTOR		N-P-8DSFA CODE NO. 000-167-921-10	2	
4	ｺﾈｸﾀ(TNC-N) CONNECTOR		TNCP-NJ CODE NO. 000-156-599-10	1	
5	絶縁ﾃｰﾌﾟ SELF-BONDING TAPE		Uﾃｰﾌﾟ 0.5X19X5M CODE NO. 000-165-833-10	1	

型式/ｺｰﾄﾞ番号が２段の場合、下段より上段に代わる過渡期品であり、どちらかが入っています。 なお、品質は変わりません。

TWO TYPES AND CODES MAY BE LISTED FOR AN ITEM. THE LOWER PRODUCT MAY BE SHIPPED IN PLACE OF THE UPPER PRODUCT. QUALITY IS THE SAME.

（略図の寸法は、参考値です。 DIMENSIONS IN DRAWING FOR REFERENCE ONLY.）

FURUNO ELECTRIC CO., LTD.

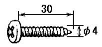
24AC-X-9403

FURUNO

CODE NO.	005-950-730-00	24AA-X-9404 -1
TYPE	CP24-00101	1/1

工事材料表

INSTALLATION MATERIALS

番号 NO.	名称 NAME	略図 OUTLINE	型名／規格 DESCRIPTIONS	数量 Q'TY	用途／備考 REMARKS
1	+ナベタッピンネジ 1シュ SELF-TAPPING SCREW		4X30 SUS304 CODE NO. 000-162-659-10	2	

型式/コード番号が２段の場合、下段より上段に代わる過渡期品であり、どちらかが入っています。　なお、品質は変わりません。

TWO TYPES AND CODES MAY BE LISTED FOR AN ITEM. THE LOWER PRODUCT MAY BE SHIPPED IN PLACE OF THE UPPER PRODUCT. QUALITY IS THE SAME.

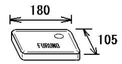
（略図の寸法は、参考値です。　DIMENSIONS IN DRAWING FOR REFERENCE ONLY.）

FURUNO

CODE NO.	004-366-960-00	24AC-X-9501 -1
TYPE	FP14-02801	1/1

付属品表

ACCESSORIES

番号 NO.	名称 NAME	略図 OUTLINE	型名／規格 DESCRIPTIONS	数量 Q'TY	用途／備考 REMARKS
1	保護カバー COVER		20-016-1091-2 ROHS CODE NO. 100-297-032-10	1	

型式/コード番号が２段の場合、下段より上段に代わる過渡期品であり、どちらかが入っています。　なお、品質は変わりません。

TWO TYPES AND CODES MAY BE LISTED FOR AN ITEM. THE LOWER PRODUCT MAY BE SHIPPED IN PLACE OF THE UPPER PRODUCT. QUALITY IS THE SAME.

（略図の寸法は、参考値です。　DIMENSIONS IN DRAWING FOR REFERENCE ONLY.）

FURUNO

CODE NO.	005-955-930-00	24AC-X-9301 -1 1/1
TYPE	SP24-00101	BOX NO. P

SHIP NO.	SPARE PARTS LIST FOR	U S E	SETS PER VESSEL

ITEM NO.	NAME OF PART	OUTLINE	DWG. NO. OR TYPE NO.	QUANTITY WORKING PER SET	QUANTITY WORKING PER VES	SPARE	REMARKS/CODE NO.
1	ヒューズ FUSE	30, φ6	FGBO-A 125V 3A PBF / FGBO-A 3A AC125V			2	000-155-850-10 / 000-549-063-00

MFR'S NAME	FURUNO ELECTRIC CO., LTD.	DWG NO.	24AC-X-9301	1/1

（略図の寸法は、参考値です。 DIMENSIONS IN DRAWING FOR REFERENCE ONLY.）

型式/コード番号が２段の場合、下段より上段に代わる過渡期品であり、どちらかが入っています。 なお、品質は変わりません。

TWO TYPES AND CODES MAY BE LISTED FOR AN ITEM. THE LOWER PRODUCT MAY BE SHIPPED IN PLACE OF THE UPPER PRODUCT. QUALITY IS THE SAME.

Antenna Cable Set

CP20-02700 (004-381-160)

CP20-02710 (004-381-170)

FURUNO

CODE NO.	004-381-190-00	20AX-X-9401 -6
TYPE	CP20-02701	1/1

工事材料表

INSTALLATION MATERIALS

番号 NO.	名称 NAME	略図 OUTLINE	型名／規格 DESCRIPTIONS	数量 Q'TY	用途／備考 REMARKS
1	ビニールテープ NO360 VINYL TAPE	60, 19	0.2X19X10000 クロ エスロン / CODE NO. 000-835-215-00	1	
2	変換ケーブル組品 CONVERT CABLE ASSY.	L=1M	NJ-TP-3DXV-1 / CODE NO. 000-123-809-00	1	
3	コネクタ(N) CONNECTOR	φ21	N-P-8DFB-CF / CODE NO. 000-156-918-10	1	
4	コネクタ(TNC-N) CONNECTOR	36.5, φ19	TNCP-NJ / CODE NO. 000-156-599-10	1	
5	絶縁テープ SELF-BONDING TAPE	82, 82, 22	Uテープ 0.5X19X5M / Uテープ 0.5X19X5M / CODE NO. 000-165-833-10 / 000-800-985-00	1	

FURUNO

CODE NO.		20AG-X-9404 -3
TYPE		1/1

明細書

DESCRIPTION

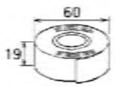
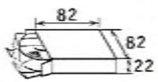
番号 NO.	名称 NAME	略図 OUTLINE	型名／規格 DESCRIPTIONS	数量 Q'TY	用途／備考 REMARKS
1	アンテナケーブル組品 ANTENNA CABLE ASSY.	L=30M	8D-FB-CV *30M* / CODE NO. 000-167-889-11	1	選択 TO BE SELECTED
2	アンテナケーブル組品 CABLE ASSY.	L=50M	8D-FB-CV *50M* / CODE NO. 000-168-241-11	1	選択 TO BE SELECTED

Antenna Cable Set
CP20-00300 (000-041-938)
CP20-00310 (000-041-939)

FURUNO

CODE NO.	005-955-570-00	24AC-X-9401 -1
TYPE	CP24-00301	1/1

工事材料表
INSTALLATION MATERIALS

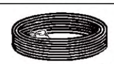
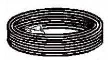
番号 NO.	名称 NAME	略図 OUTLINE	型名／規格 DESCRIPTIONS	数量 Q'TY	用途／備考 REMARKS
1	ﾋﾞﾆﾙﾃｰﾌﾟ VINYL TAPE	 60, 19	N0360 0.2X19X10000 CODE NO. 000-835-215-00	1	
2	ｺﾈｸﾀ(N) CONNECTOR	 φ21	N-P-8DFB-CF CODE NO. 000-156-918-10	1	
3	絶縁ﾃｰﾌﾟ SELF-BONDING TAPE	 82, 82, 22	Uﾃｰﾌﾟ 0.5X19X5M Uﾃｰﾌﾟ 0.5X19X5M CODE NO. 000-165-833-10 000-800-985-00	1	

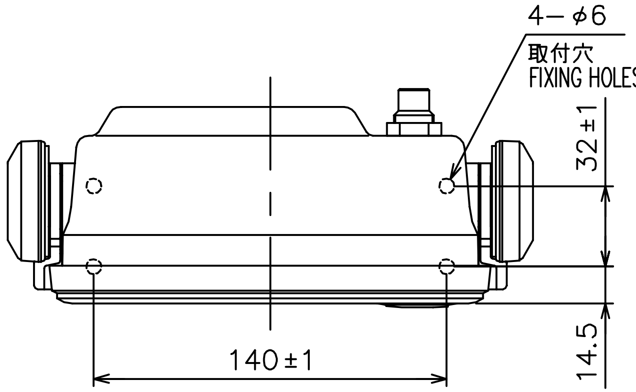
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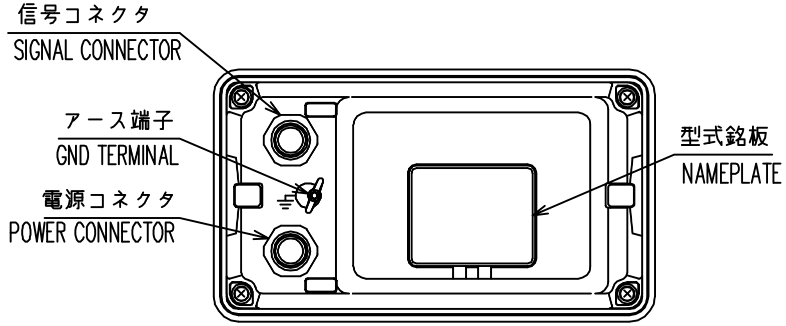
CODE NO.		14BN-X-9405 -1
TYPE		1/1

工事材料表
INSTALLATION MATERIALS

GP-3100/3050、GP-188/3100MARK-2、GP-3300

番号 NO.	名称 NAME	略図 OUTLINE	型名／規格 DESCRIPTIONS	数量 Q'TY	用途／備考 REMARKS
1	ｱﾝﾃﾅｹｰﾌﾞﾙ組品 CABLE ASSY.	 L=50M	8D-FB-CV *50M* CODE NO. 000-117-599	1	選択 TO BE SELECTED
2	ｱﾝﾃﾅｹｰﾌﾞﾙ組品 ANTENNA CABLE ASSY.	 L=30M	8D-FB-CV *30M* CODE NO. 000-111-547	1	選択 TO BE SELECTED

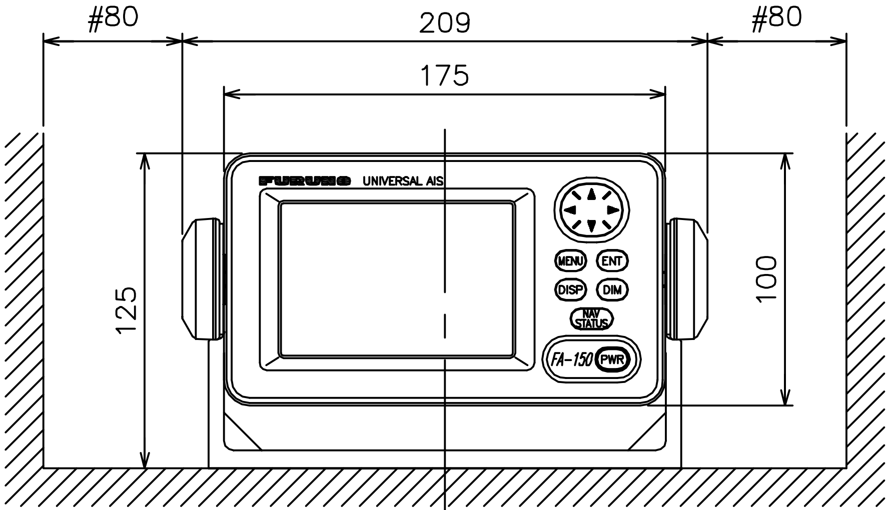


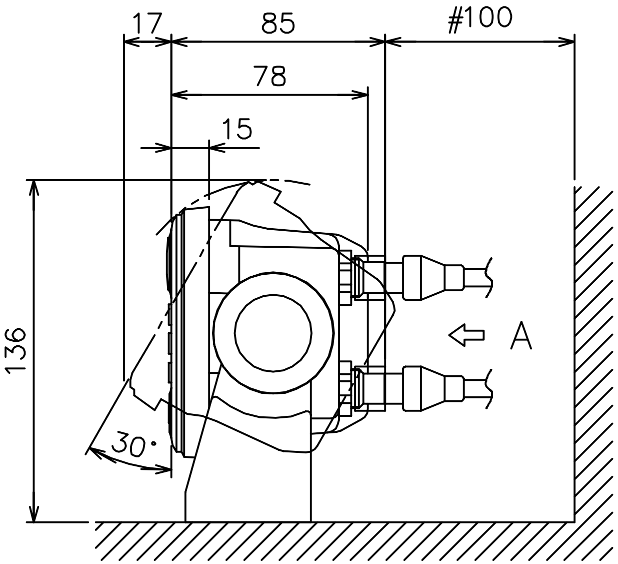


矢視 A VIEW A

表 1 TABLE 1

寸法区分（ｍｍ）DIMENSIONS	公差（ｍｍ）TOLERANCE
Ｌ≦５０	±１．５
５０＜Ｌ≦１００	±２．５
１００＜Ｌ≦５００	±３





注 記 1） 指定外寸法公差は表１による。
2） ♯印寸法は最小サービス空間寸法とする。
3） 取付用ネジはトラスタッピンネジ呼び径５×２０を使用のこと。
4） 装備ケーブルはサービス時、表示部を前方に十分引き出せるよう余裕を持たせること。

NOTE
1. TABLE 1 INDICATES TOLERANCE OF DIMENSIONS WHICH IS NOT SPECIFIED.
2. #: MINIMUM SERVICE CLEARANCE.
3. USE SELF-TAPPING SCREWS 5X20 FOR FIXING THE UNIT.
4. LEAVE ENOUGH SLACK IN CABLING SO UNIT CAN BE DRAWN FORWARD WITHOUT DISCONNECTING CABLING.

DRAWN Dec. 14, '04 E. MIYOSHI		TITLE	FA-1502
CHECKED TAKAHASHI.T		名称	表示部（卓上装備）
APPROVED Y. Hatai	FA-150		外寸図
SCALE 1/3 MASS 0.55±10% kg		NAME	MONITOR UNIT (TABLETOP MOUNT)
DWG No. C4431-G01- C	24-006-300G-2		OUTLINE DRAWING

FURUNO ELECTRIC CO., LTD.

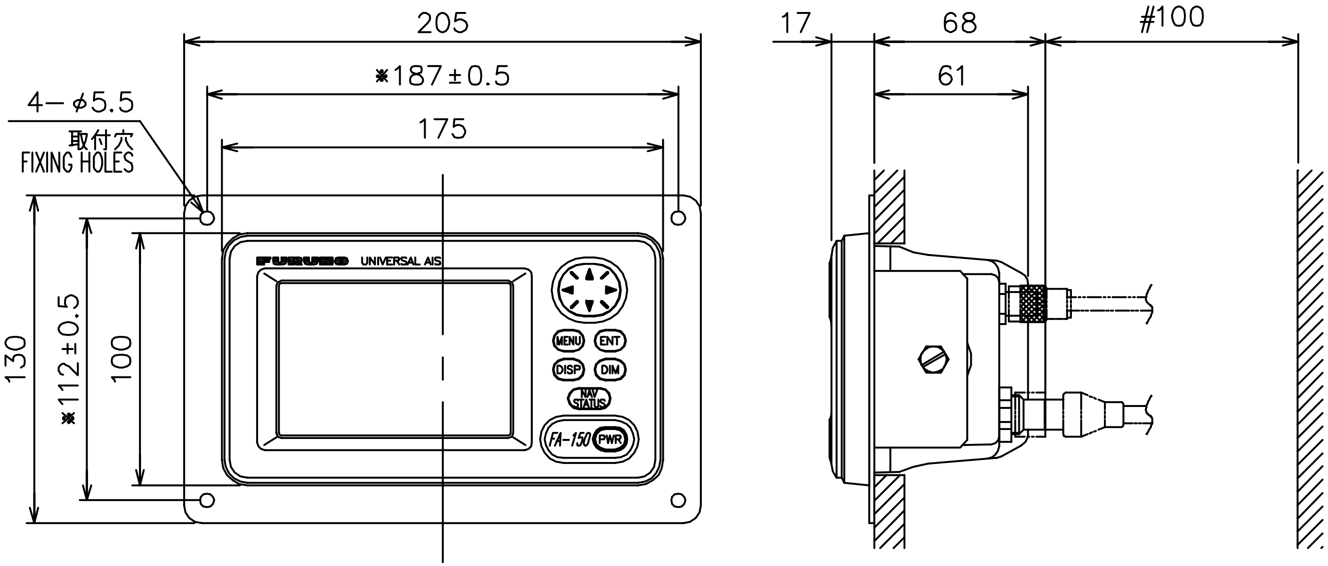
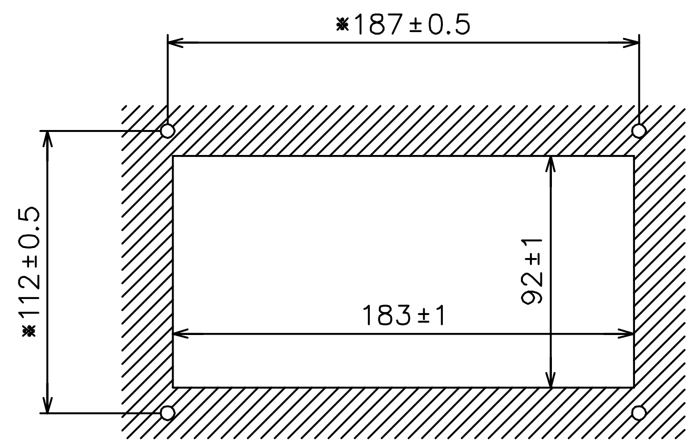


表 1 TABLE 1

寸法区分（ｍｍ） DIMENSIONS	公差（ｍｍ） TOLERANCE
Ｌ≦５０	±１．５
５０＜Ｌ≦１００	±２．５
１００＜Ｌ≦５００	±３



取付穴寸法図
CUTOUT DIMENSIONS

注 記
１） ＃印寸法は最小サービス空間寸法とする。
２） 指定外寸法公差は表１による。
３） 取付用ネジはトラスタッピンネジ呼び径５×２０を使用のこと。
４） ※印寸法は取付穴位置寸法とする。

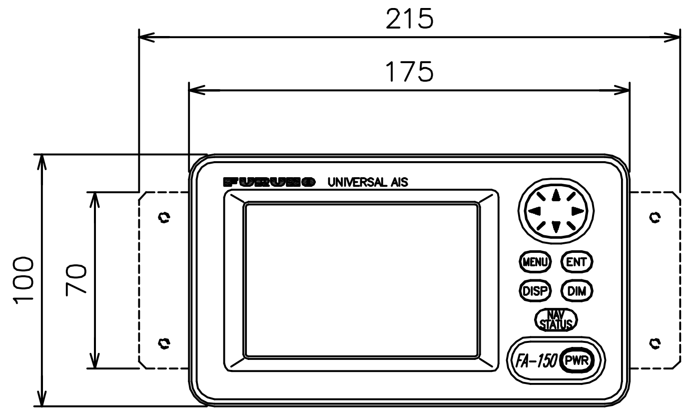
NOTE
1. #: MINIMUM SERVICE CLEARANCE.
2. TABLE 1 INDICATES TOLERANCE OF DIMENSIONS WHICH IS NOT SPECIFIED.
3. USE SELF-TAPPING SCREWS 5x20 FOR FIXING THE UNIT.
4. ※ : DIMENSIONS FOR FIXING HOLE POSITIONS.

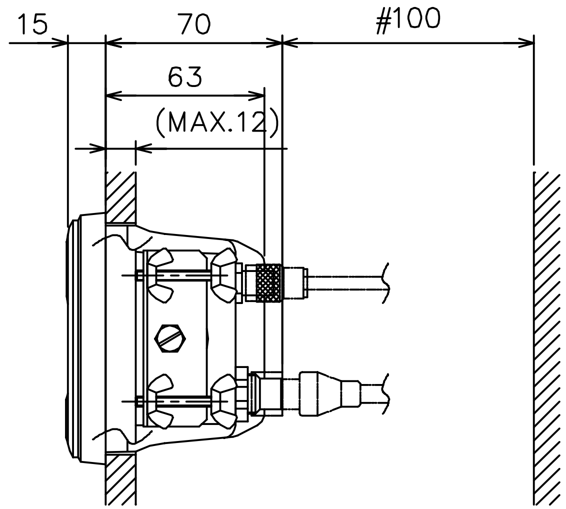
DRAWN	MAY 16,.'05 E. MIYOSHI	TITLE	FA-1502
CHECKED	TAKAHASHI. T	名称	表示部(埋込装備F)
APPROVED	Y. Hatai	FA-150	外寸図
SCALE	1/3 MASS 0.54 ±10% kg	NAME	MONITOR UNIT (FLUSH MOUNT F)
DWG.No.	C4431-G03- B	24-006-310G-0	OUTLINE DRAWING

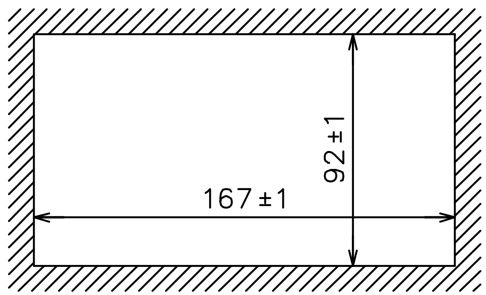
FURUNO ELECTRIC CO., LTD.

表 1 TABLE 1

寸法区分（mm） DIMENSIONS	公差（mm） TOLERANCE
L≦50	±1.5
50<L≦100	±2.5
100<L≦500	±3







取付穴寸法図
CUTOUT DIMENSIONS

注 記 1） #印寸法は最小サービス空間寸法とする。
2） 指定外の寸法公差は表1による。

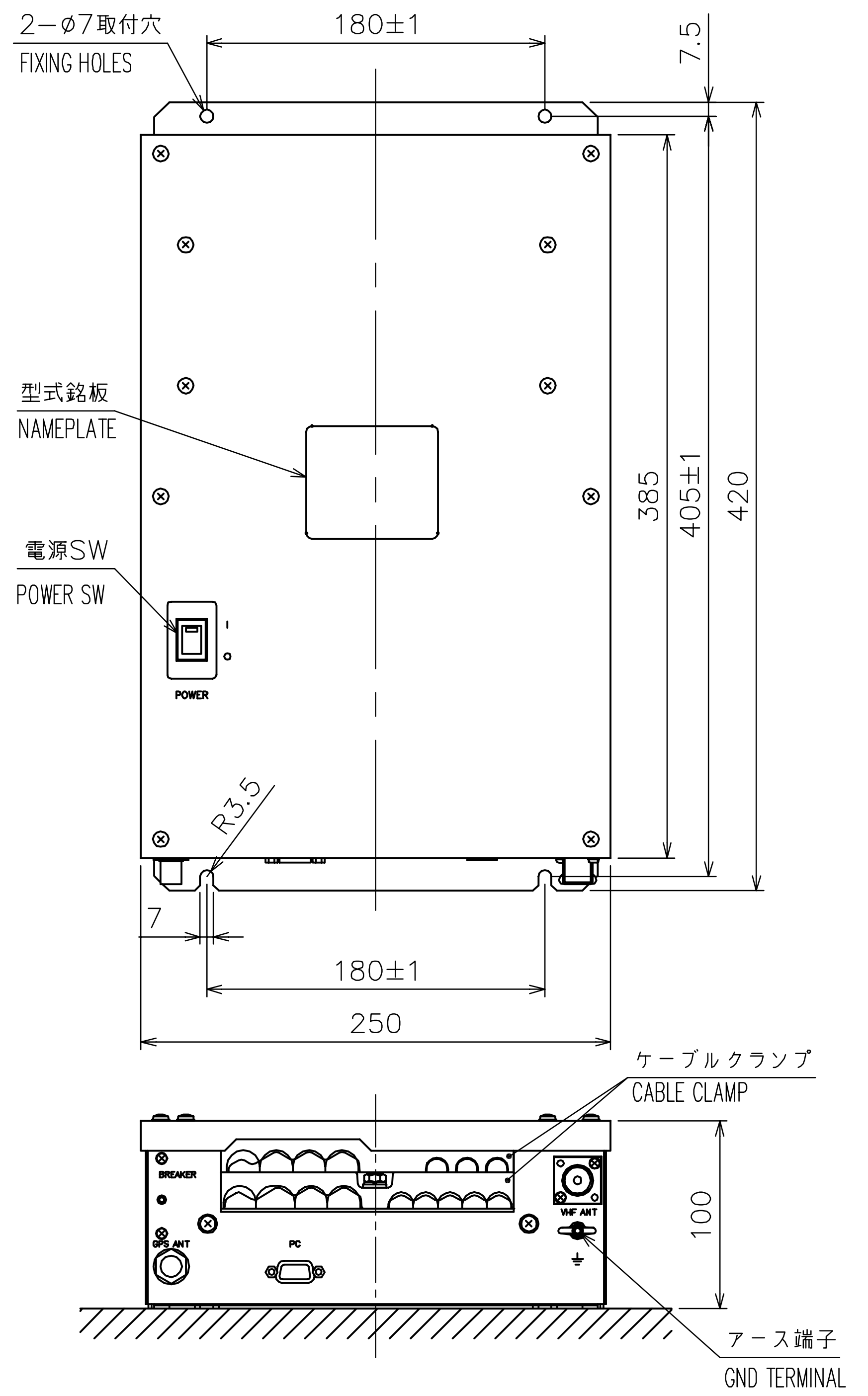
NOTE 1. #: MINIMUM SERVICE CLEARANCE.
2. TABLE 1 INDICATES TOLERANCE OF DIMENSIONS WHICH IS NOT SPECIFIED.

DRAWN	Feb. 16, '05 E. MIYOSHI	TITLE	FA-1502
CHECKED	TAKAHASHI. T	名称	表示部(埋込装備S)
APPROVED	Y. Hatai	FA-150	外寸図
SCALE	1/3 MASS 0.56 ±10% kg	NAME	MONITOR UNIT (FLUSH MOUNT S)
DWG.No.	C4431-G04- A	24-006-320G-0	OUTLINE DRAWING

FURUNO ELECTRIC CO., LTD.

FURUNO

D-4



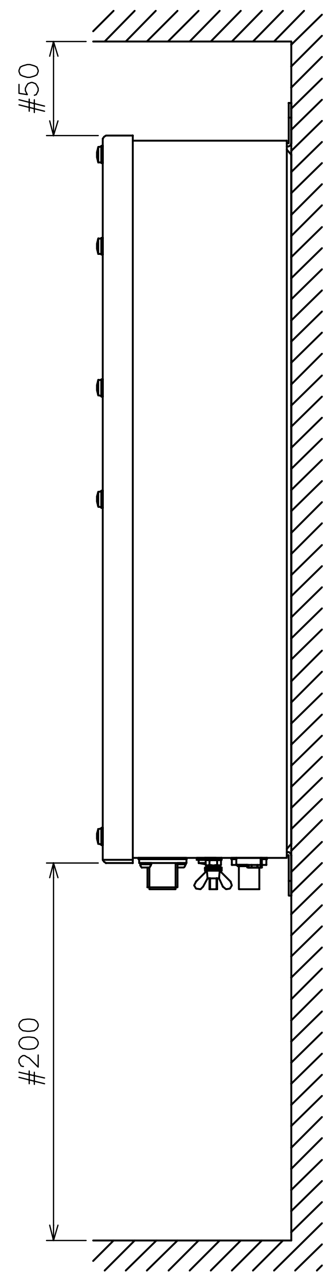


表 1 TABLE 1

寸法区分（ｍｍ） DIMENSIONS	公差（ｍｍ） TOLERANCE
Ｌ≦５０	±１．５
５０＜Ｌ≦１００	±２．５
１００＜Ｌ≦５００	±３

注　記　1）　指定外の寸法公差は表１による。
2）　#印寸法は最小サービス空間寸法とする。
3）　取付用ネジはM５ボルト、またはタッピンネジ呼び径5X20を使用のこと。

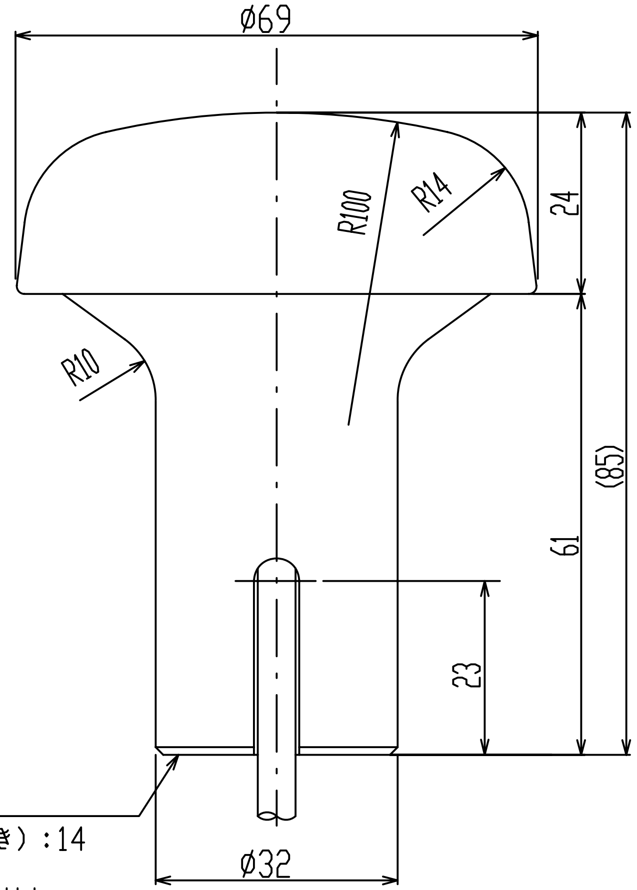
NOTE
1. TABLE 1 INDICATES TOLERANCE OF DIMENSIONS WHICH IS NOT SPECIFIED.
2. #: MINIMUM SERVICE CLEARANCE.
3. USE M5 BOLTS OR SELF-TAPPING SCREWS 5X20 FOR FIXING THE UNIT.

DRAWN Nov. 22, '04 E. MIYOSHI		TITLE	FA-1501
CHECKED TAKAHASHI. T		名称	トランスポンダ部
APPROVED Y. Hatai	FA-150		外寸図
SCALE 1/4 MASS 7.3 ±10% kg		NAME	TRANSPONDER UNIT
DWG.No. C4431-G02- B	24-006-110G- 1		OUTLINE DRAWING

FURUNO ELECTRIC CO., LTD.

表1 TABLE 1

寸法区分(mm) DIMENSION	公差(mm) TOLERANCE
L ≦ 50	±1.5
50 ＜ L ≦ 100	±2.5
100 ＜ L ≦ 500	±3



1-14UNS1B
ねじ山数(25.4mmにつき):14
ピッチ: 1.8143 mm
オネジ有効長さ:19 mm以上
オネジ有効径:24.17mm

THREAD PER 25.4mm (1 INCH): 14
PITCH: 1.8143 mm
THREAD LENGTH: 19 mm OR MORE
PITCH DIAMETER: 24.17mm

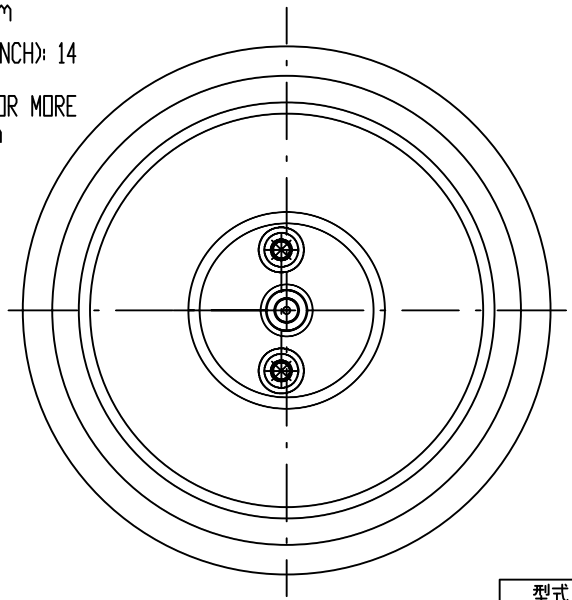


表2 TABLE 2

型式 TYPE	ケーブル長(m) CABLE LENGTH	プラグ PLAG	質量(kg±10%) MASS
GPA-017	10	TNC-P-3	0.6
GPA-017S	0.2	TNC-J-3	0.15

注記
指定外の寸法公差は表1による。

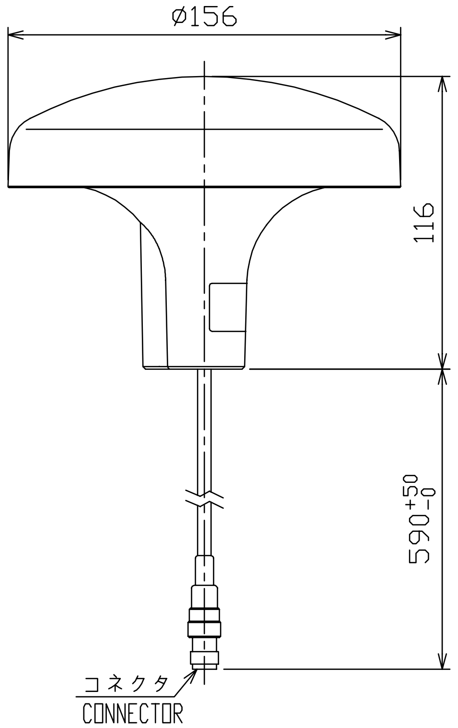
NOTE
TABLE 1 INDICATES TOLERANCE OF DIMENSIONS WHICH IS NOT SPECIFIED.

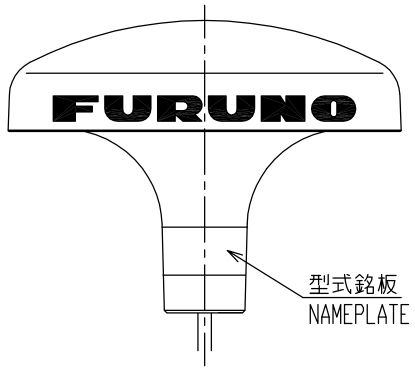
DRAWN Mar. 27 '07 T.YAMASAKI	TITLE	GPA-017/017S
CHECKED Mar. 27 '07 T.TAKENO	名称	空中線部
APPROVED Mar,27'07 R.Esumi		外寸図
SCALE 1/1 / MASS TABLE 2 表2参照	NAME	ANTENNA UNIT
DWG.No. C4384-G04- L		OUTLINE DRAWING

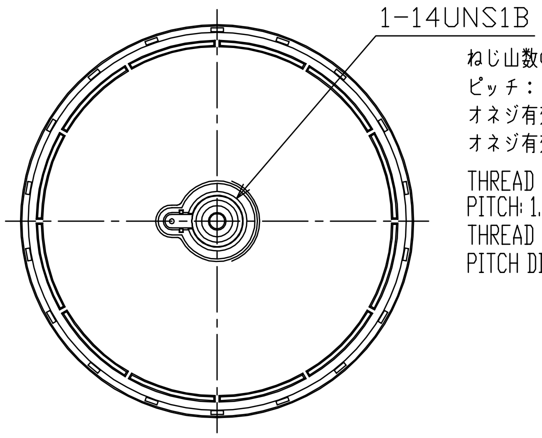
FURUNO ELECTRIC CO., LTD.

寸法区分（ｍｍ） DIMENSION	公差（ｍｍ） TOLERANCE
Ｌ≦５０	±１．５
５０＜Ｌ≦１００	±２．５
１００＜Ｌ≦５００	±３

表 1 TABLE 1







ねじ山数(25.4mmにつき)： 14
ピッチ： 1.8143 mm
オネジ有効長さ： 15.17 mm
オネジ有効径： 24.17 mm

THREAD PER 25.4mm (1 INCH): 14
PITCH: 1.8143 mm
THREAD LENGTH: 15.17 mm
PITCH DIAMETER: 24.17 mm

注　記　１）指定外の寸法公差は表１による。

NOTE　1.　TABLE 1 INDICATES TOLERANCE OF DIMENDIONS.

DRAWN May 12 '03 T. YAMASAKI		TITLE GSC-001-FA
CHECKED May 12 '03 T.Matsuguchi		名称 ＧＰＳアンテナ部
APPROVED May 20 '03 T. Matsuguchi	FA-100	外寸図
SCALE 1／3 / MASS ±10% ０．４７ kg	質量はケーブルを含む。 MASS W/ CABLE.	NAME GPS ANTENNA UNIT
DWG.No. C4417-G07- B	24-003-330G-0	OUTLINE DRAWING

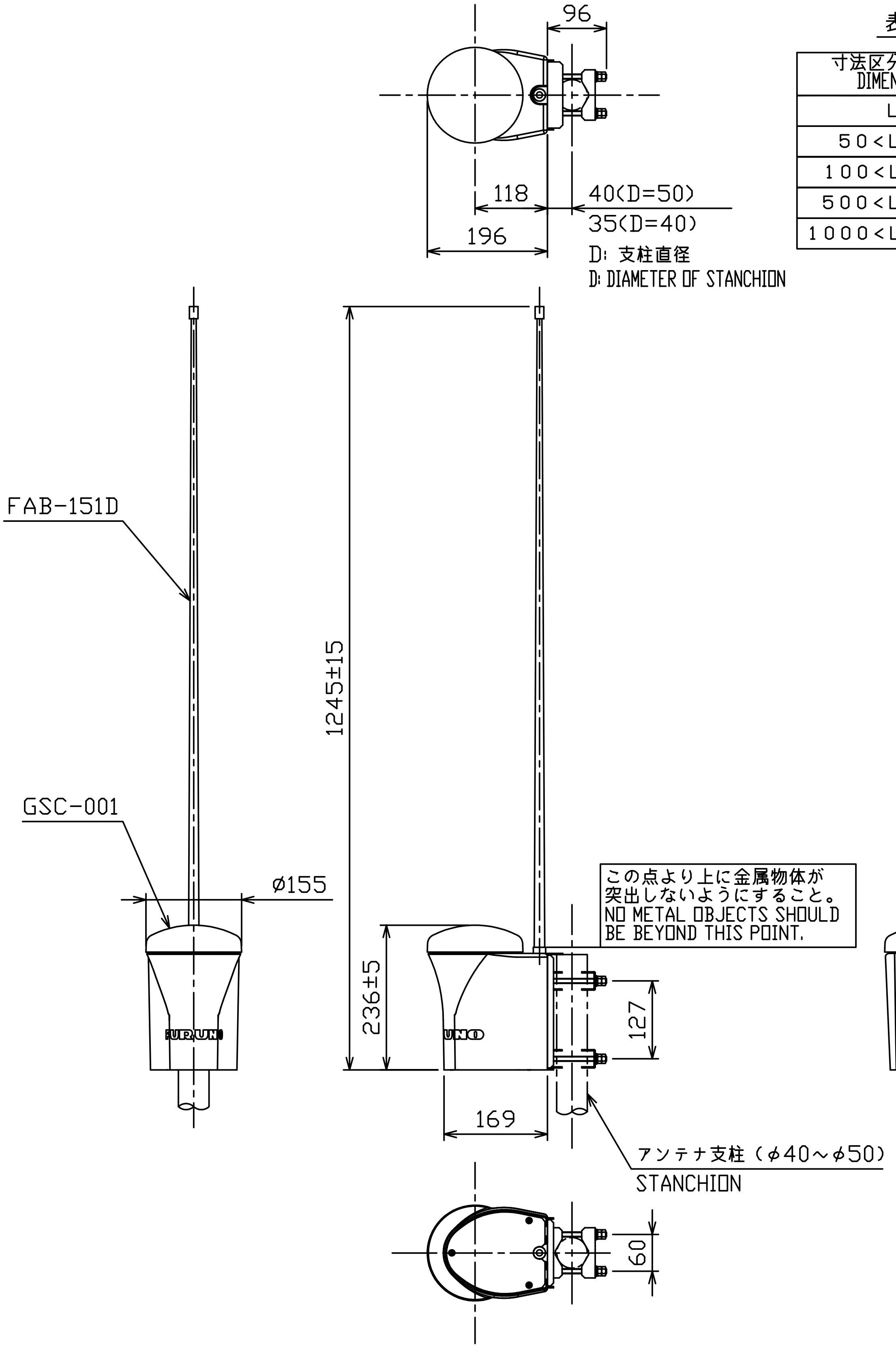
FURUNO ELECTRIC CO., LTD.

FURUNO

D-7

表1 TABLE 1

寸法区分（mm） DIMENSIONS	公差（mm） TOLERANCE
L≦50	±1.5
50<L≦100	±2.5
100<L≦500	±3
500<L≦1000	±4
1000<L≦2000	±5

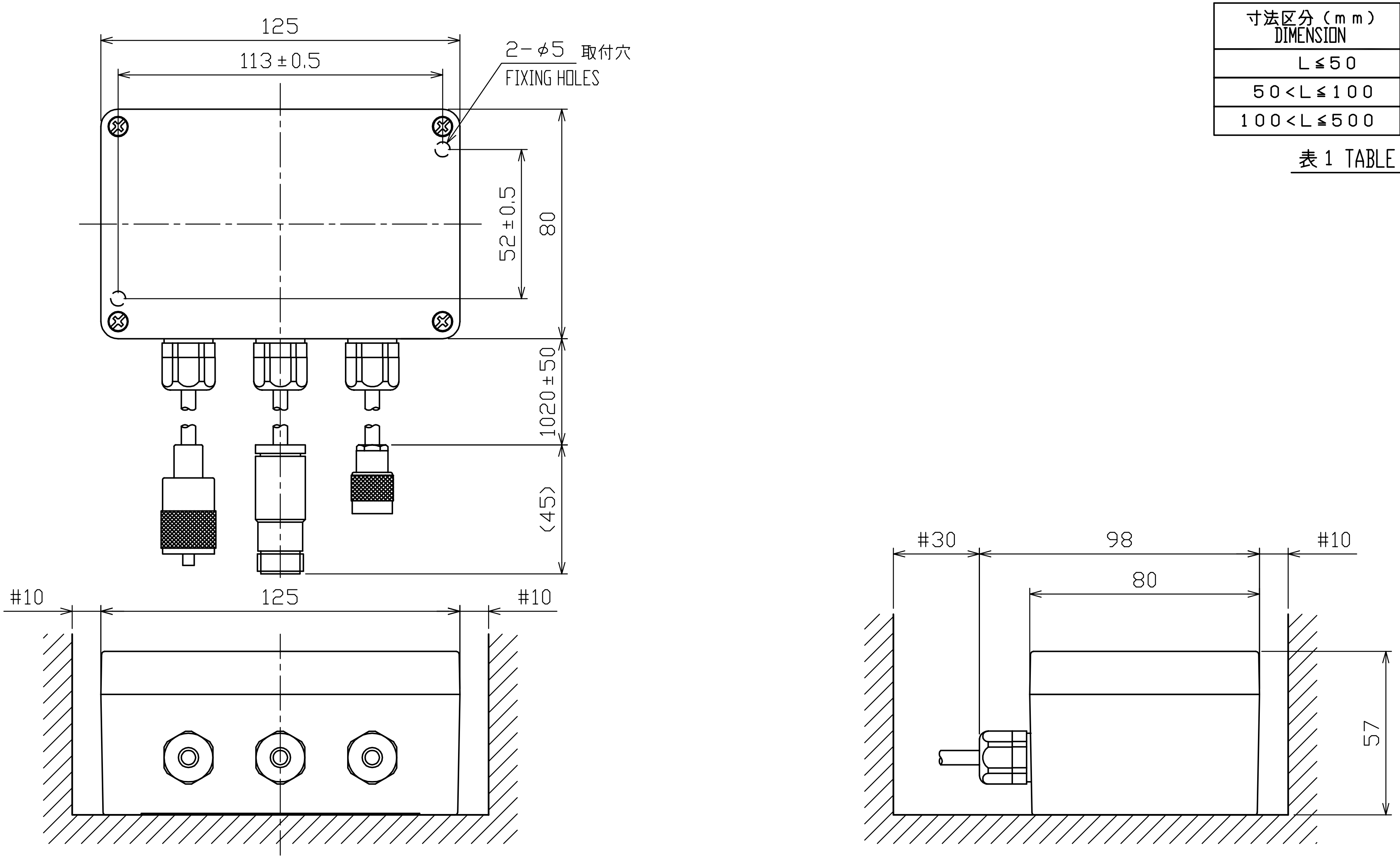


注　記　1）指定外の寸法公差は表1による。

NOTE　1.　TABLE 1 INDICATES TOLERANCE OF DIMENSIONS WHICH IS NOT SPECIFIED.

DRAWN Feb. 9 '05	T.YAMASAKI	TITLE	GVA-100
CHECKED Feb. 9 '05	T.MATSUGUCHI	名称	GPS/VHF複合空中線部 外寸図
APPROVED Feb.22'05	T.Matsuguchi	FA-100	
SCALE 1/10	MASS 3.3 ±10% kg	NAME	GPS/VHF COMBINED ANTENNA OUTLINE DRAWING
DWG.No. C4417-G02-F	24-003-301G-1		

FURUNO ELECTRIC CO., LTD.



寸法区分（ｍｍ） DIMENSION	公差（ｍｍ） TOLERANCE
Ｌ≦５０	±１．５
５０＜Ｌ≦１００	±２．５
１００＜Ｌ≦５００	±３

表１ TABLE 1

注　記　１）＃印寸法は最小サービス空間寸法とする。
２）指定外の寸法公差は表１による。
３）取付用ネジは＋ナベタッピンネジ４ｘ３０を使用のこと。

NOTE
1. #: RECOMMENDED SERVICE CLEARANCE.
2. TABLE 1 INDICATES TOLERANCE OF DIMENSIONS.
3. USE TAPPING SCREWS 4x30 FOR FIXING THE UNIT.

DRAWN Jan. 9 '03 T.YAMASAKI		TITLE	DB-1
CHECKED Jan. 9 '03 Y.KIMURA		名称	分配器 外寸図
APPROVED Jan. 9, '03 Y. Kimura	FA-100		
SCALE 1/2 MASS 0.85 kg ±10%		NAME	DISTRIBUTOR OUTLINE DRAWING
DWG No. C4417-G04-C	24-003-320G-4		

FURUNO ELECTRIC CO., LTD.

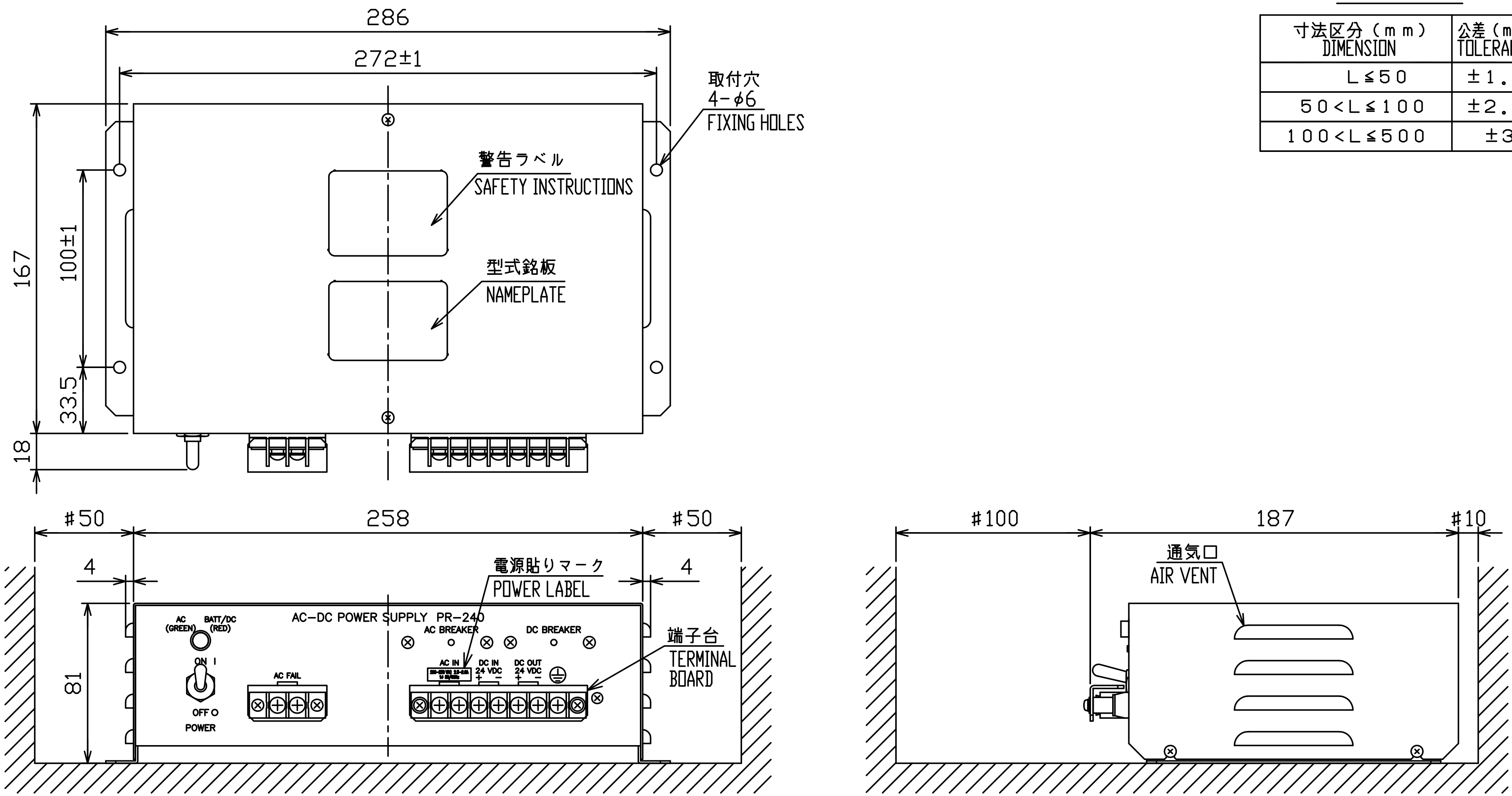


表 1 TABLE 1

寸法区分（ｍｍ） DIMENSION	公差（ｍｍ） TOLERANCE
Ｌ≦５０	±１．５
５０＜Ｌ≦１００	±２．５
１００＜Ｌ≦５００	±３

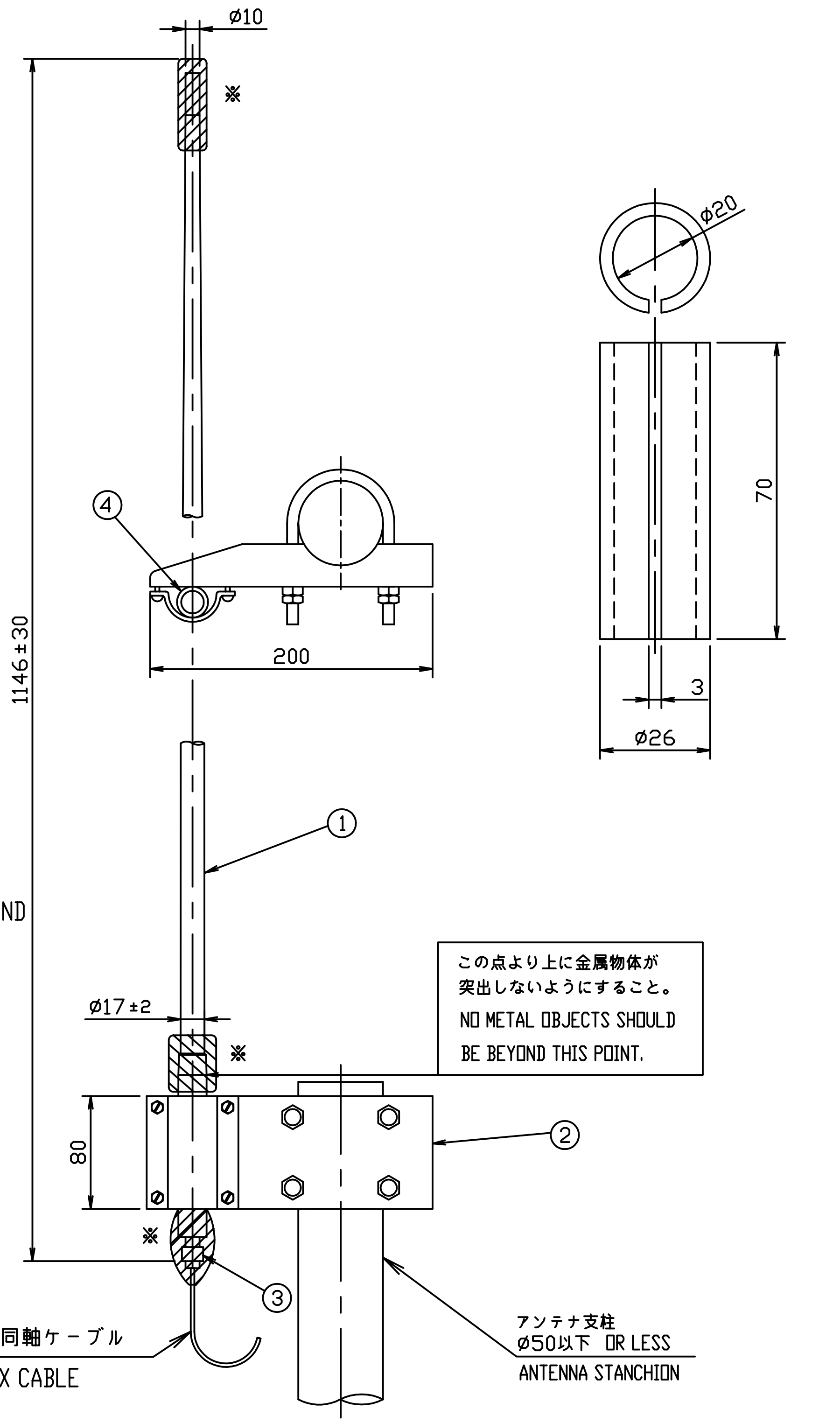
注　記　１）指定なき寸法公差は表１による。
２）#印寸法は最小サービス空間寸法とする。
３）取付用ネジは＋トラスタッピンネジ 呼び径４ｘ１６を使用のこと。

NOTE
1. TABLE 1 INDICATES TOLERANCE OF DIMENSIONS WHICH IS NOT SPECIFIED.
2. #: MINIMUM SERVICE CLEARANCE.
3. USE TAPPING SCREWS ø4x16 FOR FIXING THE UNIT.

DRAWN	25/Sep/09 T.YAMASAKI	TITLE	PR-240
CHECKED	25/Sep/09 T.TAKENO	名称	AC／DC電源ユニット 外寸図
APPROVED	26/Oct/09 R.Esumi		
SCALE	1/3 MASS 3.2 ±10% kg	NAME	AC/DC POWER SUPPLY UNIT OUTLINE DRAWING
DWG No.	C5003-G03- J	REF. No.	24-003-500G-4

FURUNO ELECTRIC CO., LTD.

FURUNO



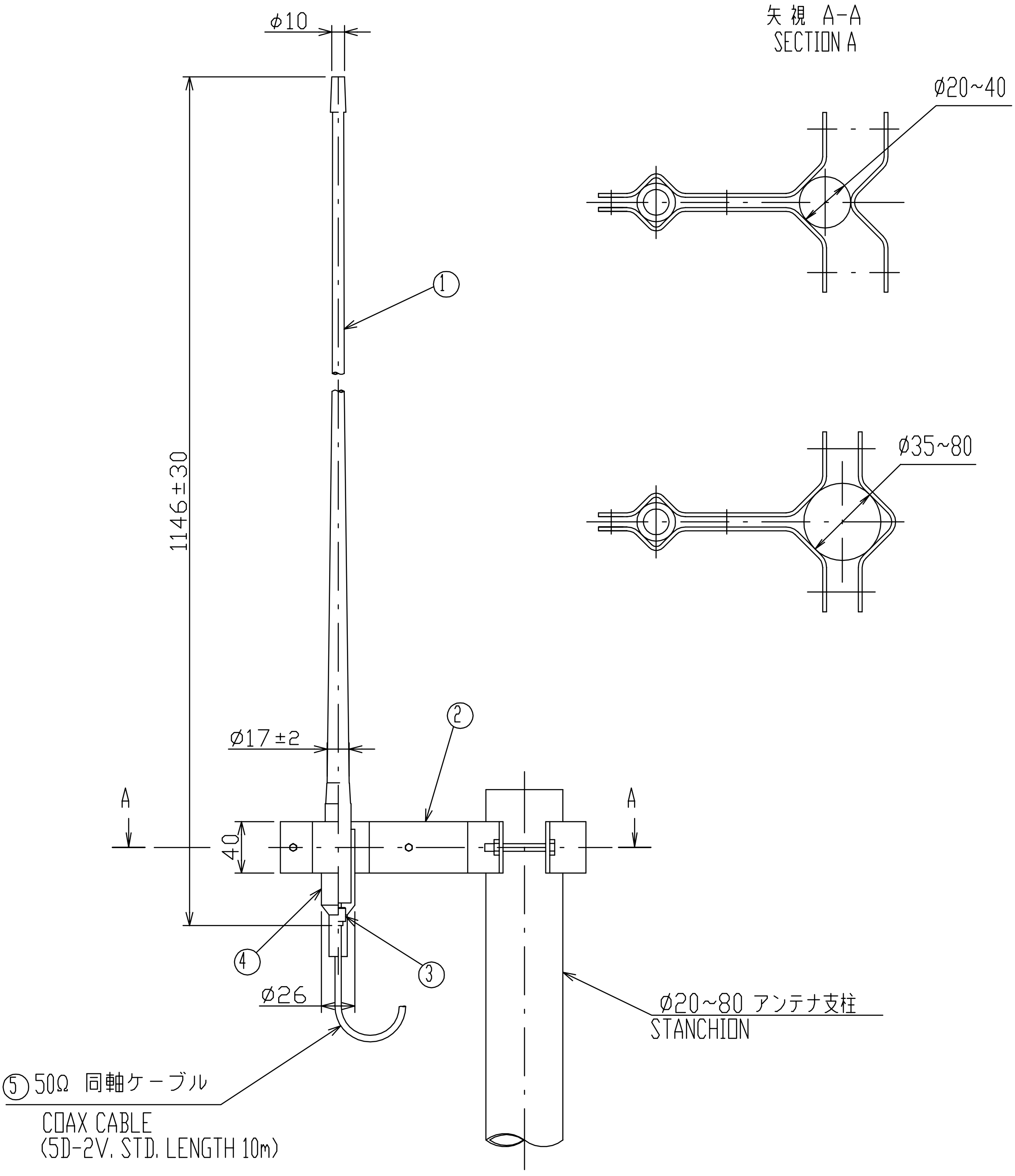
※ 斜線部は自己融着テープを巻き
更にビニールテープを巻いて
防水処理をおこなうこと。

SEAL WITH SELF-BONDING TAPE AND
PVC TAPE FOR WATERTIGHTNESS.

品番 ITEM	品名 NAME	材質 MATERIAL	数量 Q'TY	図番 DWG.No.	摘要 REMARKS
4	固定用パイプ LINER PIPE	硬質塩ビ VINYL CHLORIDE	1		
3	同軸コネクタ COAX. CONNECTOR		1		M-R
2	アンテナ取付金具 ANTENNA BRACKET	SUS	1 式 SET	4-310071	0.6kg
1	アンテナ棒 ANTENNA ELEMENT	FRP	1		0.25kg

DRAWN Feb. 1 '05 T.YAMASAKI		TITLE	FAB-151D
CHECKED Feb. 1 '05 T.MATSUGUCHI		名称	150MHz ホイップアンテナ
APPROVED Feb.02'05 T. Matsuguchi			外寸図
SCALE 1/5	MASS 0.85 kg ±10%	NAME	150MHz WHIP ANTENNA
DWG.No. C5013-019- J	4-110718		OUTLINE DRAWING

FURUNO ELECTRIC CO., LTD.



品番 ITEM	品名 NAME	材質 MATERIAL	数量 Q'TY	図番 DWG.No.	摘要 REMARKS
5	同軸ケーブル 50Ω COAX. CABLE		10m	5D-2V	
4	塩ビキャップ CONNECTOR CAP		1		
3	同軸コネクタ COAX. CONNECTOR		2	M-P-5	
2	アンテナ取付金具 ANTENNA BRACKET		1 式 SET		t2
1	アンテナ棒 ANTENNA ELEMENT	FRP	1	150M-W2VN	0.25kg

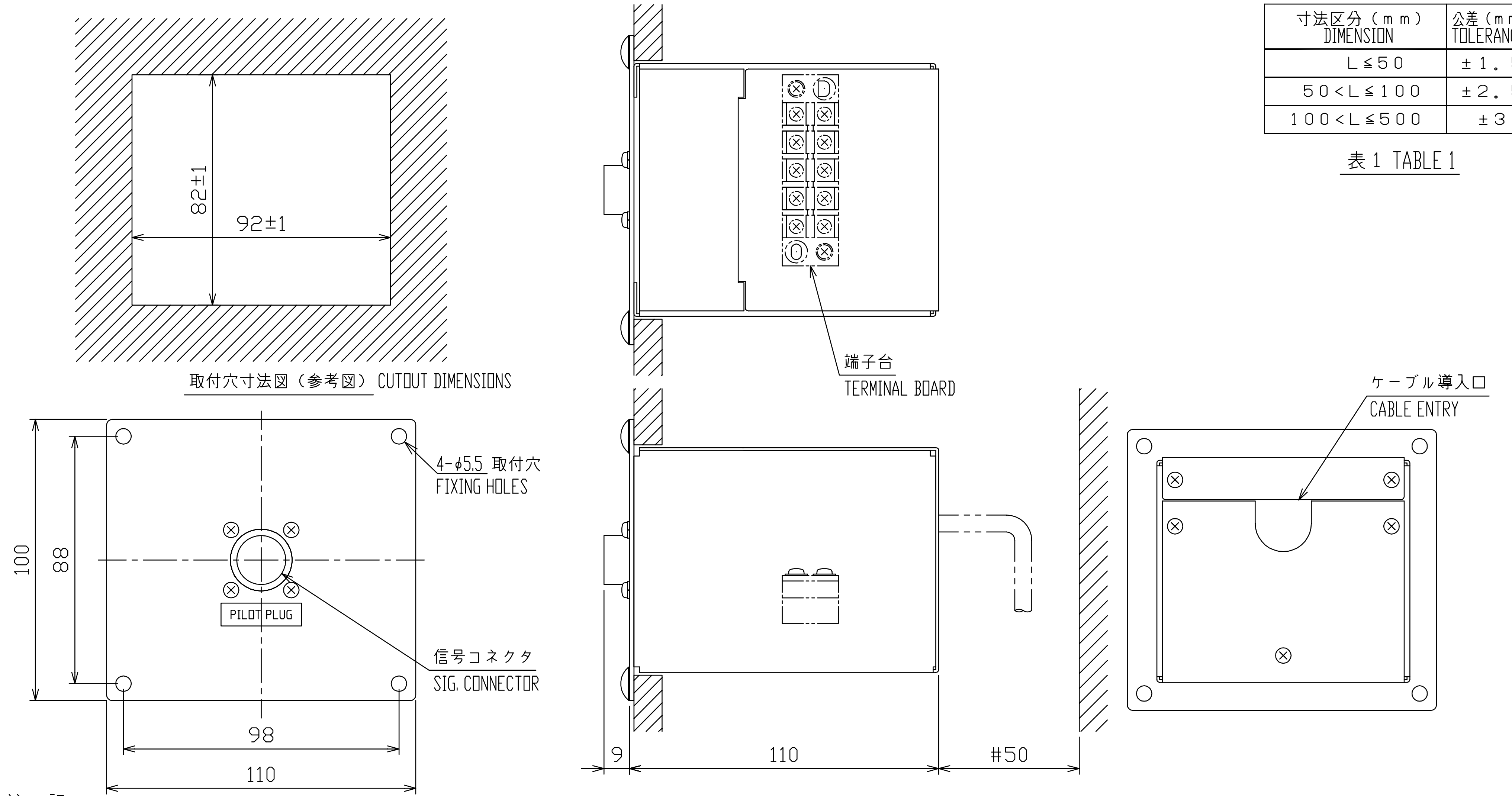
DRAWN Nov. 26 '03 T.YAMASAKI	TITLE 150M-W2VN
CHECKED Nov. 26 '03 T.TAKENO	名称 150MHzホイップアンテナ
APPROVED Nov.28'03 T. Matsuguchi	外寸図
SCALE 1/5 MASS 0.7 ±10% kg	NAME 150MHz WHIP ANTENNA
DWG.No. C5011-042- C	OUTLINE DRAWING

FURUNO ELECTRIC CO., LTD.

FURUNO

寸法区分（ｍｍ） DIMENSION	公差（ｍｍ） TOLERANCE
Ｌ≦５０	±１．５
５０＜Ｌ≦１００	±２．５
１００＜Ｌ≦５００	±３

表 1 TABLE 1



注　記

１）＃印寸法は推奨するサービス空間寸法。

２）指定外の寸法公差は表１による。

３）取付にはＭ５ボルト、またはトラスタッピンネジ呼び径５を使用のこと。

NOTE

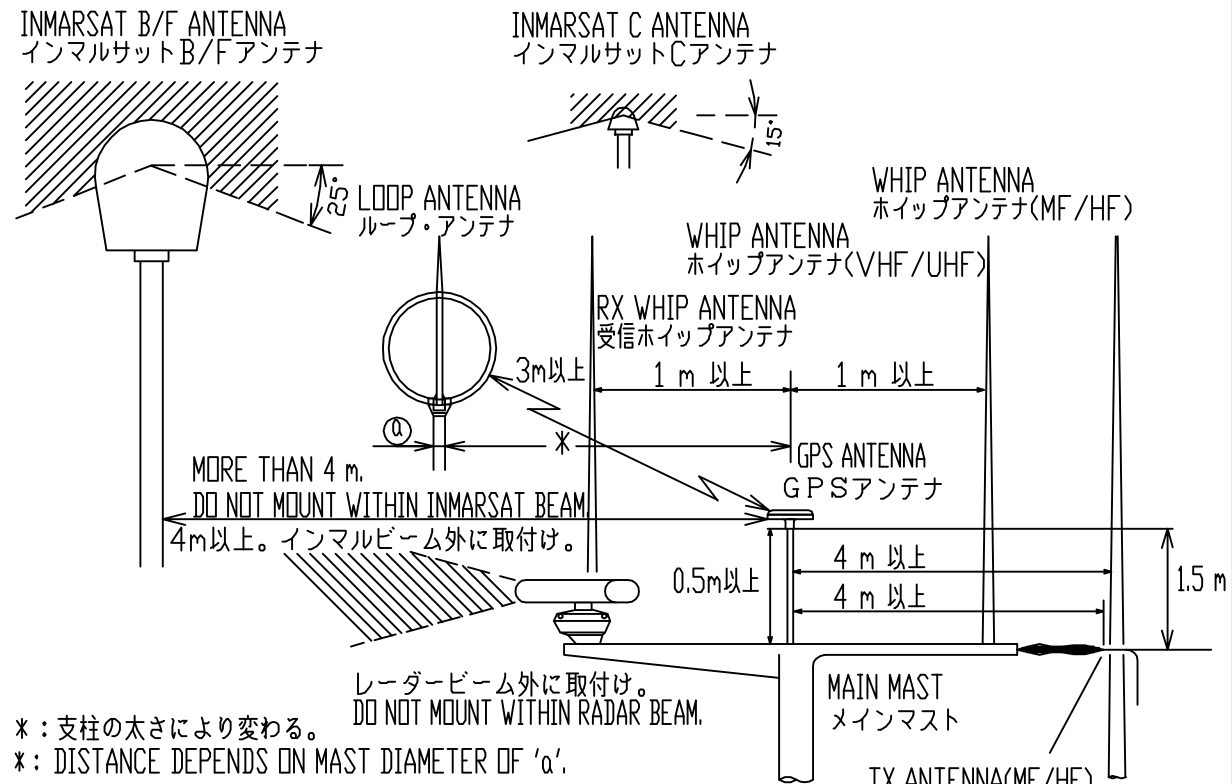
1. #: RECOMMENDED SERVICE CLEARANCE.
2. TABLE 1 INDICATES TOLERANCE OF DIMENSIONS.
3. USE M5 BOLTS OR TAPPING SCREWS φ5 FOR FIXING THE UNIT.

DRAWN Oct. 2 '03 T.YAMASAKI		TITLE	OP24-3
CHECKED Oct. 2 '03 T.MATSUGUCHI		名称	パイロットプラグユニット
APPROVED Oct.02'03 T.Matsuguchi	FA-100		外寸図
SCALE 1/2	MASS 0.58 ±10% kg	NAME	PILOT PLUG UNIT
DWG.No. C4417-G08- D	24-003-420G-1		OUTLINE DRAWING

FURUNO ELECTRIC CO., LTD.

取付位置
MOUNTING LOCATION

他の機器のアンテナから下の図の距離以上離す。
THIS FIGURE SHOWS THE SEPARATION DISTANCES FROM OTHER ANTENNAS TO AVOID MUTUAL INTERFERENCE.

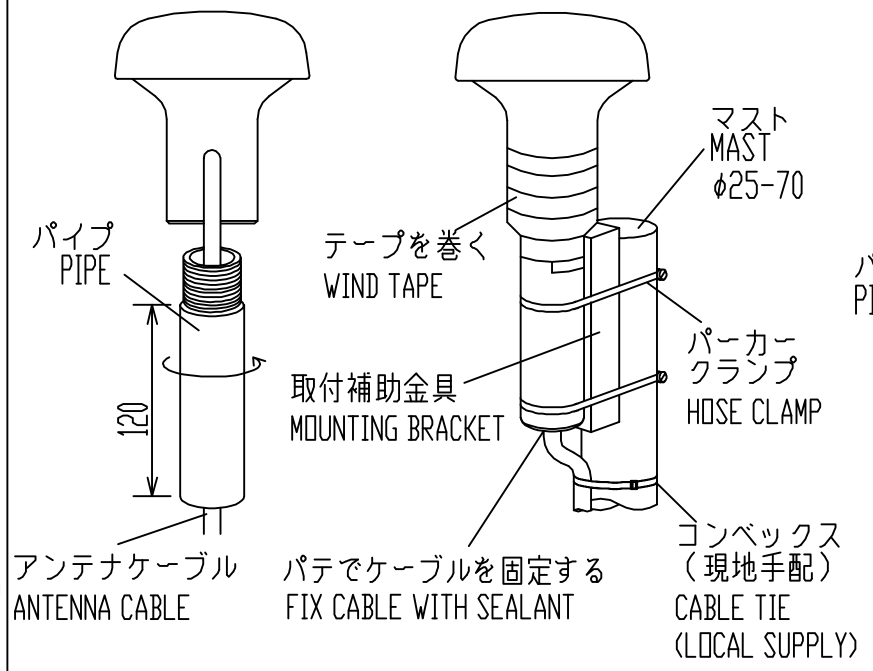


*：支柱の太さにより変わる。
*: DISTANCE DEPENDS ON MAST DIAMETER OF 'a'.

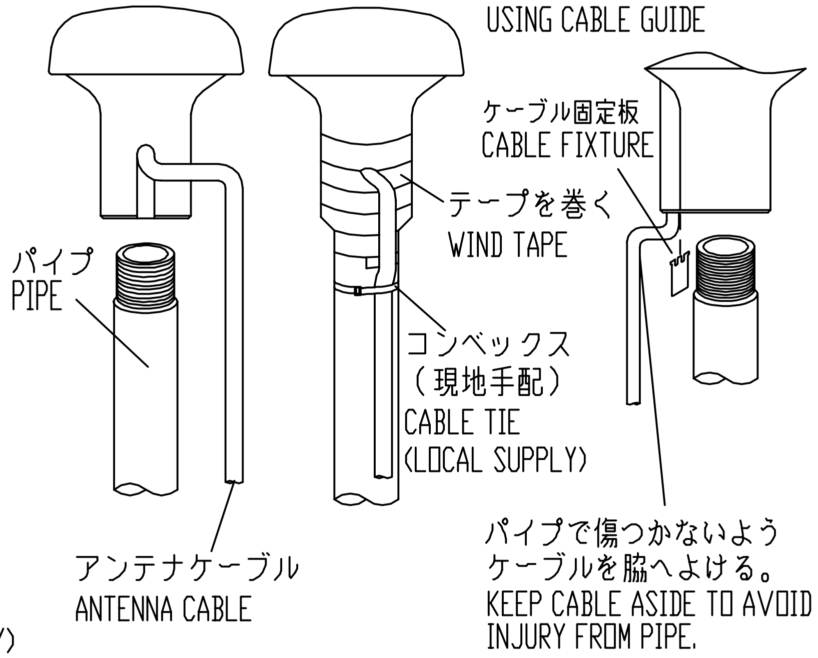
aの直径 DIA. OF 'a'	確保する距離 DISTANCE (MIN.)
10 cm	1.5 m
30 cm	3 m

A) マストへの取付け MAST MOUNTING

a)マスト取付金具CP20-01111(工事材料)でマストに固定する。
USE MAST MOUNTING KIT CP20-01111.



b)パイプのみを使うとき
USE A PIPE ONLY.

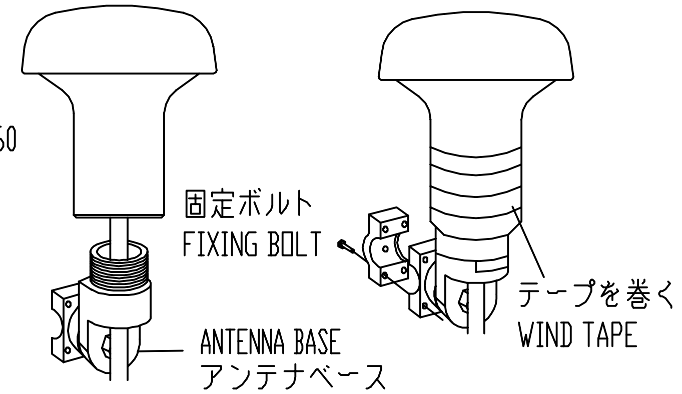


B) スタンションやパルピットにつけるとき

レール用アンテナベース No.13-RC5160
(取付可能レール直径：ϕ19~ϕ32)
(コード番号：000-806-114)

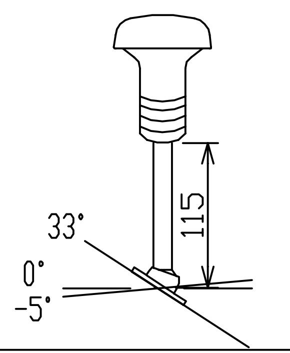
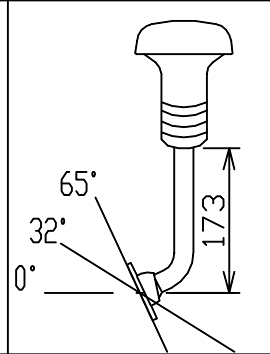
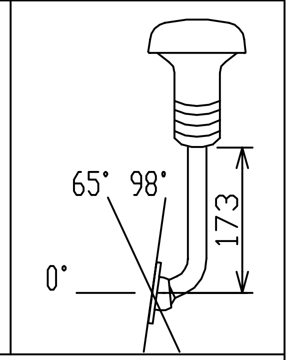
HANDRAIL MOUNTING

USE HANDRAIL MOUNTING BASE No.13-RC5160 (CODE No.000-806-114, OPTION).
THE DIAMETER OF THE HANDRAIL MAY BE FROM ϕ19mm TO ϕ32mm.

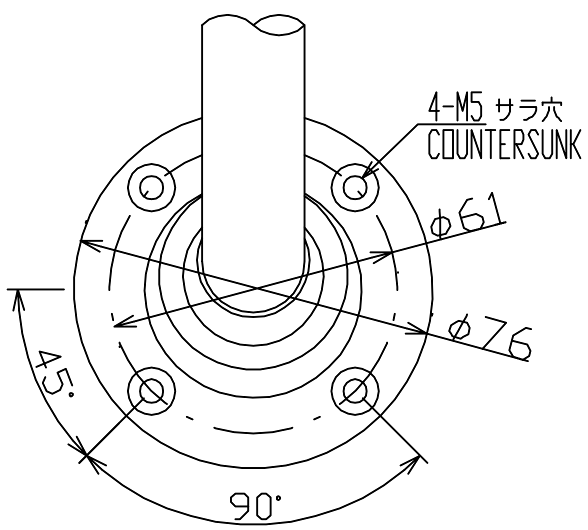


C) 取付ける場所が傾斜しているとき ANTENNA BASE MOUNTING

オプションのアンテナベースを使う。
USE OPTIONAL ANTENNA BASE.

傾斜 INCLINATION	-5° - 33°	32° - 65°	65° - 98°
装備方法 MOUNTING METHOD			
アンテナベース型式 ANT. BASE TYPE	直型アンテナベース RIGHT ANGLE ANTENNA BASE No.13-QA330	L型アンテナベース L-TYPE ANTENNA BASE No.13-QA310	
コード番号 CODE No.	000-803-239	000-803-240	

アンテナベース基部
MOUNTING DIMENSIONS OF ANTENNA BASE.

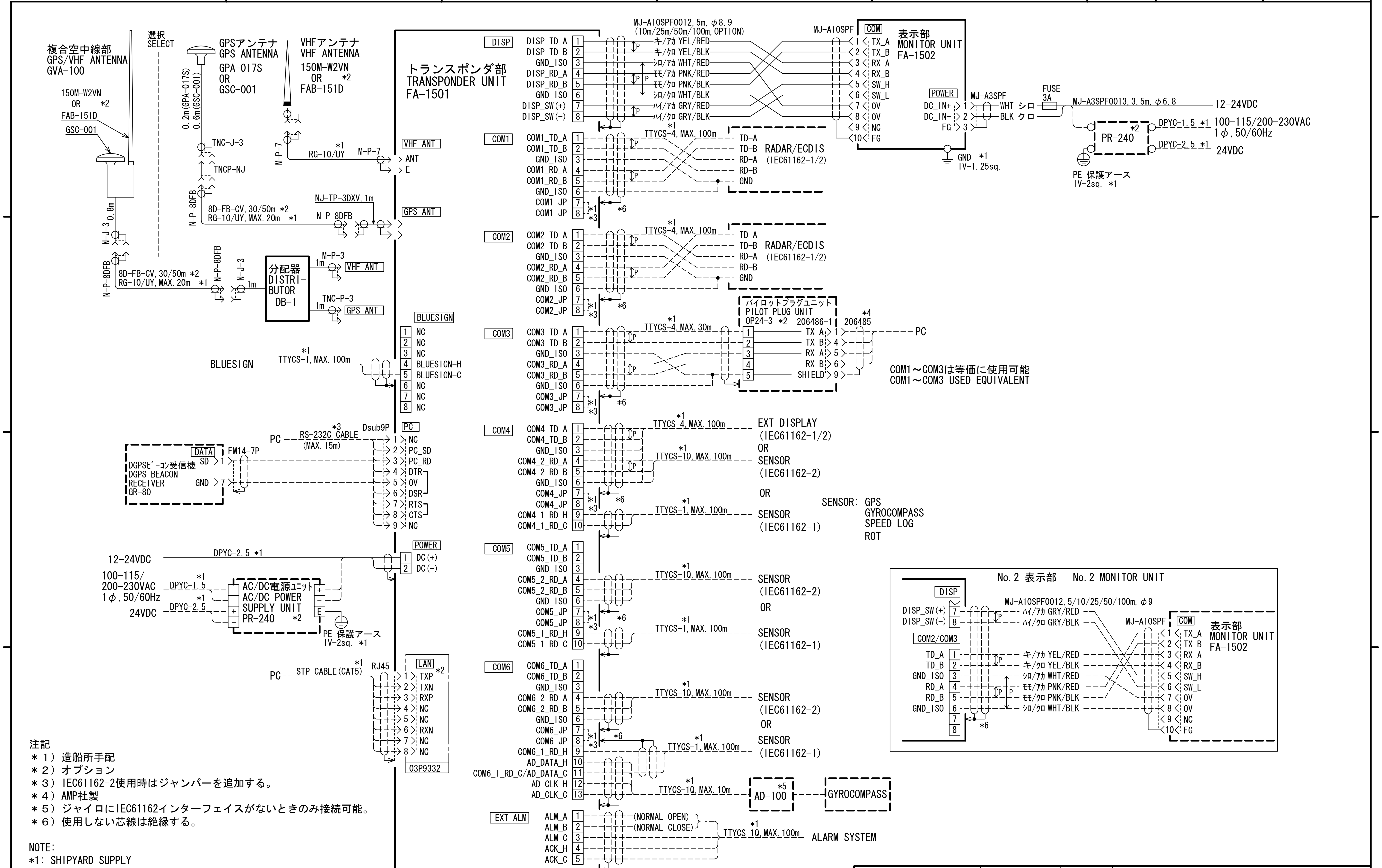


注記 1) パイプやアンテナベースはアンテナユニットにねじ込んだ後に固定する。
2) アンテナを固定するときはパイプ(アンテナベース)をアンテナにねじ込むこと。
アンテナ側をねじるとコネクタ部やケーブルに無理がかかり、故障の原因となる。

NOTE 1. FASTEN PIPE(ANTENNA BASE) TO ANTENNA UNIT FIRST THEN FIX THEM TO MAST OR HANDRAIL.
2. WHEN FIXING ANTENNA, TURN PIPE OR ANTENNA BASE; NOT THE ANTENNA.
TURNING THE ANTENNA MAY TWIST THE CABLE AND PLACE STRESS ON CONNECTOR.

DRAWN	Dec. 14, '05 E.MIYOSHI	TITLE	GPA series
CHECKED	TAKAHASHI.T	名称	空中線部 装備要領図
APPROVED	Y. Hatai		
SCALE	MASS	NAME	ANTENNA UNIT INSTALLATION PROCEDURE
DWG.No.	C4384-Y01- E		

FURUNO ELECTRIC CO., LTD.



注記
＊1）造船所手配
＊2）オプション
＊3）IEC61162-2使用時はジャンパーを追加する。
＊4）AMP社製
＊5）ジャイロにIEC61162インターフェイスがないときのみ接続可能。
＊6）使用しない芯線は絶縁する。

NOTE:
*1: SHIPYARD SUPPLY
*2: OPTION
*3: ADD JUMPER WHEN USING IEC61162-2.
*4: PRODUCED BY AMP INC.
*5: GYRO CONVERTOR IS AVAILABLE WHEN GYROCOMPASS HAS NO IEC61162 INTERFACE.
*6: INSULATE UNUSED WIRES.

IEC61162-1: 4800BPS
IEC61162-2: 38.4KBPS

DRAWN	17/Aug/09 T.YAMASAKI	TYPE	FA-150
CHECKED	17/Aug/09 T.TAKENO	名前	国際船舶自動識別装置
APPROVED	21/Aug/09 R.Esumi		相互結線図
SCALE	MASS kg	NAME	U-AIS TRANSPONDER
DWG. No.	C4431-C01- P		INTERCONNECTION DIAGRAM

S-1

FURUNO ELECTRIC CO., LTD.